



ECONOMICS OF EDUCATION

B RAJAIAH

This little book originated with concern for the prevailing overlook the importance of education. Economics of Education is a growing subject of general interest. Economists persist in thinking of education in terms of economic importance, the importance of education. The idea of development of Capital has been fully explained in this book. The cost-benefit analysis of educational expenditure has been explained for the common reader. The book continues to draw public attention to the importance of Education. Dr. B. Rajaiah, has made a survey of primary education in Madhya Pradesh. This is his contribution to the growth of Economics of Education. Some important concepts are explained. The reader is led to a realistic view so as to prove that primary education to new education cannot be ignored. It provides information on the role and contribution of Education to economic development. Economics of Education has been written for all types of readers. The book will also prove useful to policy makers. Education is an investment to the individual and the society. ECONOMICS OF EDUCATION formulates principles governing investment in Education. The importance of human resource development has been brought out in this book. Education is important in all developing countries. Its decisive influence on economic development cannot be overlooked. The book can be profitably used by students, and the public at large. It is one of the policy oriented books on Economics of Education.

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ECONOMICS OF EDUCATION

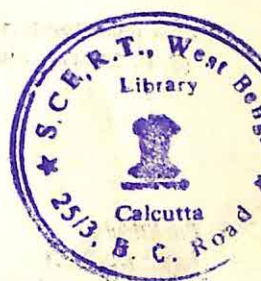
“ Spread Universal elementary education for the age-group 6-14 with special emphasis on girls, and voluntary agencies in programmes for the removal of the adult illiteracy”.

Mrs. Indira Gandhi
Prime Minister,
Govt. of India
New—20-Point Programme.

ECONOMICS OF EDUCATION

(A Study of Primary Education in Andhra Pradesh)

B. RAJIAH



MITTAL PUBLICATIONS

DELHI-110035 (INDIA)

ECONOMICS OF EDUCATION

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379
RAJ

First published in 1987
© B. Rajaiah, 1987

S.C.E.R.T., West Bengal

Date 11-5-87

Acc. No. ~~3425~~ 4023

A. Banerjee

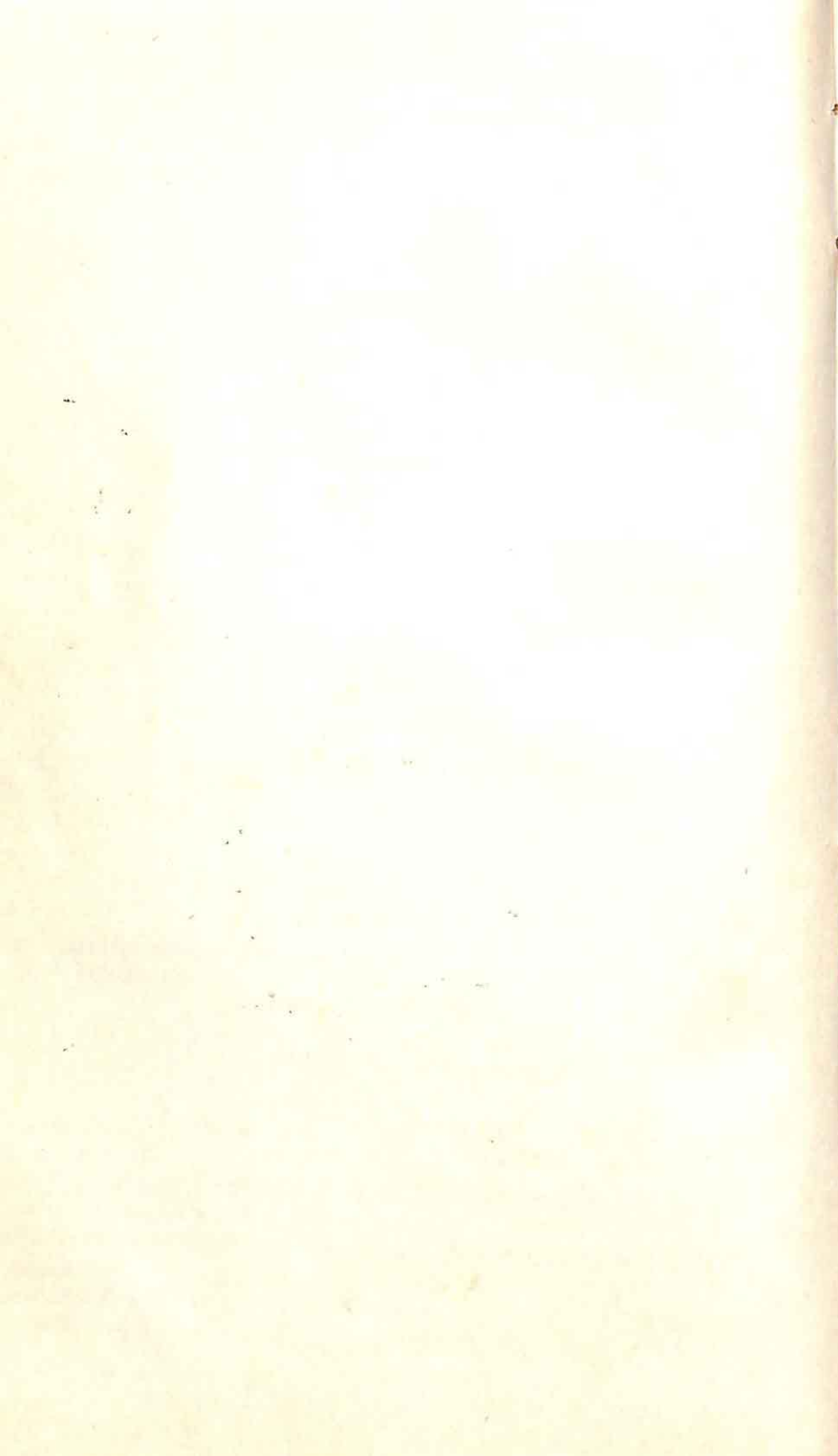
Published by

K.M. MITTAL
MITTAL PUBLICATIONS
B-2/19B, Lawrence Road
DELHI-110035 (INDIA)

Printed at

AMAR PRINTERS
DELHI-110035

*To
My
Serving Wife*



Preface

Effective government, education and social justice emerge as critically important in all developing countries. The tasks before developing communities are to build the system of public administration, to spread popular enlightenment which is economically efficient as social justice. One of the advantages of lagging behind developed countries is that the developing countries can take advantage of what has been worked out by the advanced countries, and avoid costs of errors.

Present educational system which is 'top heavy, bottom weak,' needs to be rebuilt. The success of popular education depends on the willingness of the people to sacrifice at least their leisure. The demands for schooling outpace the aggregate development of job opportunities. The economists have recently tended to be concerned with the problem of education. Knowledge once created becomes a free good, and use of it by one individual does not reduce its availability to others.

The importance of primary education has receded with the expansion of higher education. It is believed that the growth of higher education is acting as a constraint in the expansion of primary education. L.K. Jha says "More of the available resources for education get diverted to colleges, while the spread of primary education gets slowed down". There appear to be serious dangers in heavy investment in higher education. It reflects the preferences of planners but not of the people. One must recognise that social justice is indispensable for social progress. Prof. J.K. Galbraith says that a hydro-electric project is much easier to launch than a sound system of elementary

education. Poverty may be the cause of ignorance but it is also the result. A person with low income shows marked reluctance to accumulate additional schooling even at zero level of investment, because of negative slope of marginal benefit curve. The marginal cost, incorporating benefit of time spent in school, appears to exceed marginal benefits. The earning of the children at school age are presumed to be negligible or near zero, but their education is a consumption good. The illiterate person does not derive the consumption benefits of literacy which include the value of services from education as a durable consumer good.

It is natural but not irrelevant to quote from the speeches of Prof. J.K. Galbraith, during Rajaji Memorial Lectures delivered in March 1982 in India, "There is no country with uniformly literate population that does not have a relatively high and progressive living standards. There is no country with a generally illiterate population that does. Some will suggest that the living standard allows of the education, more will believe rightly that the principal causation runs the other as surely it does.

Elementary education is free and compulsory and reflected the belief that it was the first essential of economic progress. Primary education, is a free good, that is intended to break the accommodation to the culture of poverty. Democracy requires a literate and informed citizenry. Education must never be without a strong commitment, personal and public to discipline. There is a challenge to the belief that what is right for advanced industrial countries is right for all".

Popular education is the first requisite of economic progress. The spread of primary education is an end in itself. Participatory democracy presupposes the existence of well informed citizenry. One of the reasons for neglecting popular enlightenment appears to be the importance of ignorance for achieving personal or political success by the leaders. Illiteracy was allowed to continue. Soon after popular government was established, hopes of the people were raised high for better living standards. But large volume of public expenditure was reportedly wasted

because of incompetent and corrupt administration. Integrity of people is an indigeneous product and not something to be imported. And Educational Plans were not better implemented. The importance of social sense has to be recognised for achieving economic progress.

L.R. Brown in his book *In the Human Interest* stated that elementary education is effective in reducing the fertility of women. Assessing economic contribution of Primary Education, Dr. Venkatsubramanian says that schooling educates the children in number of ways *i.e.*, punctuality, achievement motivation, willingness to take orders, to accept responsibility which are vocationally useful.

Educational development is a historical process. The flow of instruction from advanced countries remains unchanged. The course content appropriate to advanced countries, cannot be applied without waste to early stages of development, characterised by relentless struggle with numerous problems. The failure to evolve national educational policy, appropriate to the stage of political, cultural and economic sequence has been a prime source of error. Popular education designed on the currently perceived needs, came to be taken for granted as competent instrument of progress. As the quantitative expansion of elementary education advanced its standard or quality apparently receded. Much needs to be said on this fascinating subject, but under commanding pressures of space and time something relevant has been said, not to be taken as final or comprehensive. To our sorrow and frustration, illiteracy remained a stumbling block even after three and half decades of concern for educational development. Illiteracy might be viewed as a hindrance to the achievement of reasonable standard of economic progress.

Education and character of a person appear to be related, the co-efficient of correlation between intelligence and character was found to be between +0.2 and +0.5.

The progress of primary education in Andhra Pradesh has been stupendous. The vote on account budget presented to

the Assembly on 19 March 1982, provides some illumination on the subject. Besides continuing primary school and non-formal education centres opened in earlier years, it is proposed to open 600 Primary Schools in schoolless centres.

The enrolment at the primary stage by the end of 1981-82 was 55.10 lakhs. This is proposed to be increased to 56-50 lakhs by the end of 1982-83. An amount of Rs. 50 lakhs has been provided in the budget for 1982-83 for improving school buildings. An amount of Rs. 23 lakhs have been provided under capital outlay for completing the school buildings under construction.

The present study is expected to cover important topics relating to primary education in Andhra Pradesh. It is intended to excite thinking and provoke discussion. This study may offer valuable information to the people interested in the first stage of education. The capacity of the study to cash in on its credibility is limited. This study is the product of nearly 400 man days devoted by the project director and Rs. 4200 direct cost, the grant received from the National Council of Educational Research and Training, New Delhi.

In spite of enormous odds of study my hope is realised in completing this modest project. The commercial efficiency of any project is said to depend on the quantity and quality of its product in relation to the expenditure of money, time and effort. The incidence of its benefits is on those who derive pleasure and satisfaction in reading this report. In education, the turn over is not to be measured in number of copies printed, or sold, but the size of its readers or beneficiaries, the time it tends to last. The benefits of any work are likely to be diffused to all citizens of the region or country. The impact of ordinary work of this nature tends to be eroded in the currents of time stream. This report is no exception, and may be lost soon. But the object of this study is considered partly fulfilled if it stimulates further studies in this field. But the returns to research are assumed to be below or uncertain, and unattractive. Much remains to be done in this field. Studies of this sort tend to make some contribution to the development of efforts

to increase efficiency and obtain better results in the spread of basic literacy with high standards. The commercial efficiency is the principal victim in all research projects and it tends to be eroded. Compilation of basic data, in this study may introduce substantial degree of bias, the choice of the research project may reflect bias. People have become conditioned to tolerate a measure of bias in social dealings.

The potential benefits from any study generally take considerable time to be realised but the costs are immediate, to determine whether there are net benefits or costs associated with any project, one would like to weigh the advantages against disadvantages. The decision is not purely economic one, the weight be attached to costs and benefits would have to be established by non-economic considerations. The project has to incur net costs but as the work progresses. The original parameters might gradually change and net benefits would eventually flow.

The scheme of chapterisation spells out some sequence in accepted or acceptable pattern. The chapters indicate a rough division of materials to be presented. The report writing is organised as follows. First chapter attempts to picture a general view of the study. In the Second Chapter approaches to Human Capital are discussed while the Third Chapter is devoted to study the Cost-benefit analysis of expenditure on education. Fourth Chapter throws light on the progress of Primary Education in the State in terms of enrolment of pupils. The Fifth Chapter analyses costs of primary education. The problem of wastage in education in Andhra Pradesh is dealt in Sixth Chapter. The Seventh Chapter presents correlation analysis between literacy rates and other economic variables *i.e.*, agricultural productivity, fertility, and work participation. The concluding Chapter summarises the results of the study.

Attempts to draw generalisation on the basis of this study is fraught with risks. The study is meant to be a modest beginning in the field of primary education, and likely, to reflect growing interest in popular education. The data are subject to errors arising from human failings or possible mis-specification. The primary aim of this study is to provide quantitative illumination on the subject. The study also examined a fascinating

question of removal of illiteracy. Certain important statistics like opportunity costs, demand estimates indicate a set of complicated measures. The results are explained by the limitation of the data, but the dominant pattern of results is consistent with other earlier studies.

A debt of gratitude is owed to the National Council of Educational Research and Training, New Delhi, which furnished grant for undertaking this Project. The author is deeply indebted to many individuals and institutions which extended aid in completing this project. The author expresses grateful thanks to Prof. V.N. Kothari, the Head Department of Economics, M.S. University Baroda for his help throughout. He has taken pains in going through the entire manuscript. The assistance received from Sri. K.K. Ranga Reddy, Dy. Director, Planning and Development, Sri. Seetha Rama Rao, Statistical Officer, Sri. T. Satyanarayana, the Section Officer in the Office of the Directorate of School Education, Hyderabad, Government of Andhra Pradesh is duly acknowledged with thanks. The author expresses thanks to the librarians of Osmania University, NCERT, SCERT, Bureau of Economics and Statistics, various other centres of research. The comments of anonymous referees are gratefully acknowledged.

The author is indebted to his wife Smt. Subhadra, who kept him awake to complete the work as per time schedule.

Thanks are due to all those who lent their helping hand.

For all errors or shortcomings in this study, the author deserves all blame.

—B. RAJAIAH

Contents

<i>Preface</i>	vii
I. EDUCATION AND ECONOMIC DEVELOPMENT	1
II. APPROACHES TO HUMAN CAPITAL	23
III. COST-BENEFIT ANALYSIS OF EXPENDITURE ON EDUCATION	40
IV. PRIMARY EDUCATION IN ANDHRA PRADESH	50
V. INVESTMENT IN PRIMARY EDUCATION IN ANDHRA PRADESH	103
VI. WASTAGE IN PRIMARY EDUCATION : ANDHRA PRADESH	128
VII. FRUITS OF PRIMARY EDUCATION	145
VIII. SUMMARY AND CONCLUSIONS	162
<i>Glossary</i>	169
<i>References</i>	173
<i>Suggested Readings</i>	175
<i>Index</i>	177

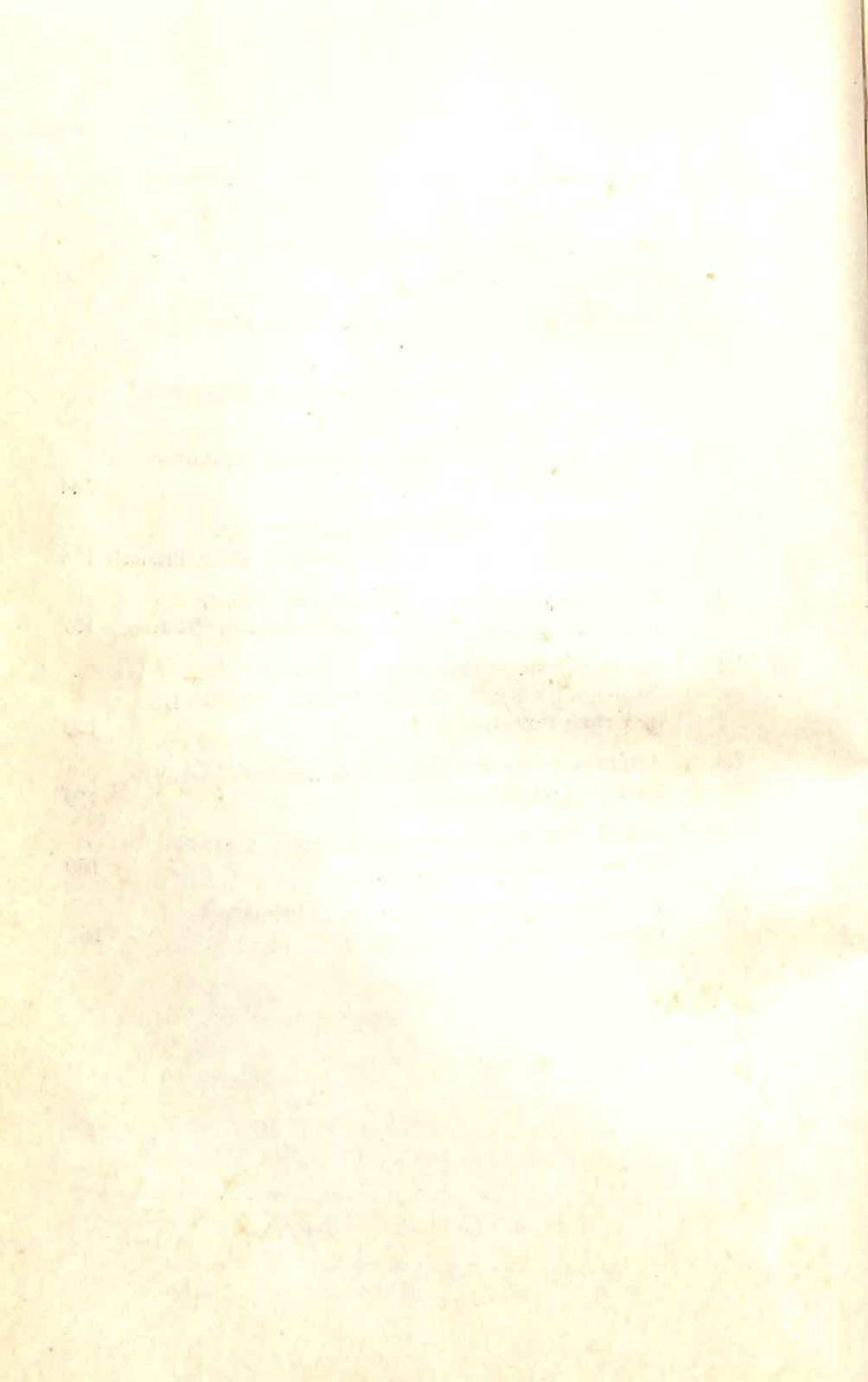
List of Tables

4.1	The Pupil Enrolment In Primary Schools-Andhra Pradesh	73
4.2	The enrolment of Students in Primary School and Primary Sections of Upper Primary Schools and Higher Secondary School-Andhra Pradesh	74
4.2(A)	Enrolment Index in Primary Education—Andhra Pradesh	75
4.3	No. of Primary School by Management—Andhra Pradesh	76
4.4	Statement Showing No. of Teachers in Primary Schools in Andhra Pradesh	79
4.3(A)	Number of Primary Schools—Sex-wise in Andhra Pradesh	79
4.5	Percentage of Enrolment of Boys in Primary Education—Andhra Pradesh	80
4.6	Percentage of Enrolment of Girls in Primary Education—Andhra Pradesh	81
4.7	The Enrolment of the Children in Primary Education—Andhra Pradesh	82
4.8	Cycles in the Enrolment of Boys and Girls in I Class And NDP at 1960-61 Prices—A.P	83
4.9	Class-wise Enrolment of Boys in Primary Education—Andhra Pradesh.	84
4.10	Class-wise Enrolment of Girls in Primary Education—Andhra Pradesh	86
4.11	School Efficiency—Enrolment Ratio in Primary Education in A.P.—Boys	88

4.12	School Efficiency-Enrolment Ratio in Primary Education—A.P. Girls	89
4.13	Input-Output Ratios in Primary Education—Boys—A.P.	90
4.14	Input-Output Ratios in Primary Education—Girls—A.P.	91
4.15	Output of Primary Schools, Literacy Rates, and Per Capita Income—in different States	92
4.16	District-wise Enrolment in Primary Schools during the year 1978-79—Andhra Pradesh	93
4.17	Class-wise Enrolment of Boys of the Scheduled Castes in Primary Schools—A.P.	94
4.18	Class-wise Enrolment of Girls of Scheduled Castes in Primary Schools—A.P.	95
4.19	Class-wise Enrolment of Boys of Scheduled Tribes in Primary Schools—Andhra Pradesh	96
4.20	Class-wise Enrolment of Girls of Scheduled Tribes In primary School—Andhra Pradesh.	97
4.20(A)	The Enrolment of Children in Primary Schools, District-wise—A.P. 1978	98
4.21	The Teacher-Pupil Ratio in Primary Schools—Andhra Pradesh	99
4.22	Primary School Teacher Index—Andhra Pradesh	100
4.23	Trained Teachers in Primary Schools in Andhra Pradesh	101
4.24	Women Teachers in Primary Education in Andhra Pradesh	102
5.1	Total Expenditure on All Educational Institutions—Direct and Indirect in Andhra Pradesh	117
5.2	Public Expenditure on Education As a Percentage of NDP (National Domestic Product) At Current Prices—Andhra Pradesh	118

5.3	Average Annual Per Pupil Expenditure in Primary Education—Andhra Pradesh	119
5.4	Average Per Pupil Expenditure or Unit Cost in Primary Schools—At 1960-61 Prices	120
5.5	Expenditure on Primary Education as Percentage of Total Revenues of the State Andhra Pradesh	121
5.6	Growth Rates in State's Revenues and Expenditure on Education and Expenditure on Primary Education in Andhra Pradesh	122
5.7	Expenditure on Primary Schools as a Percentage of Total Expenditure on All Educational Institutions—Andhra Pradesh	123
5.8	Budget Allocation for Primary Education in Andhra Pradesh	124
5.8(A)	Budget Allocation for Secondary Education Including Primary Education—Andhra Pradesh.	124
5.9	Average Annual Cost in Primary Education As a Percentage of NDP Per Capita in Andhra Pradesh	125
5.10	Total Government Support to Primary Education in Andhra Pradesh	126
5.11	Total Real Cost in Primary Education in Andhra Pradesh	127
6.1	Cumulative Wastage in Primary Education in Andhra Pradesh—Boys	135
6.2	Cumulative Wastage in Primary Education in Andhra Pradesh—Girls	136
6.3	Cumulative Wastage in Primary Education in Andhra Pradesh—Scheduled Castes-Boys	137
6.4	Cumulative Wastage in Primary Education in in Andhra Pradesh—Scheduled Castes-Girls	138
6.5	Cumulative Wastage in Primary Education Andhra Pradesh—Scheduled Tribes-Boys	139

6.6	Cumulative Wastage in Primary Education in Andhra Pradesh—Scheduled Tribes Girls	140
6.7	Wastage of Human Resources in Primary Education A.P.—Boys	141
6.8	Wastage of Human Resources in Primary Education—A.P.—Girls.	142
6.9	Wastage of Public Funds in Primary Education in Andhra Pradesh—Boys	143
6.10	Wastage of Public Funds in Primary Education in Andhra Pradesh—Girls	144
7.1	Literacy Rates, Agricultural Productivity, Percentage of Workers, Districts of Andhra Pradesh	156
7.2	Public Expenditure on Primary Education, And Agricultural Productivity in Andhra Pradesh	157
7.3	Literacy Rates—Percentage of Area Under Non-Food Crops—Andhra Pradesh Percentage of Urban Population	158
7.4	Literacy Rates and Population Decennial Growth Rates—Andhra Pradesh	159
7.4(A)	Female Literacy Rates and Decennial Growth Rates of Population—A.P.	160
7.5	The Demand for the Teachers in Primary Education in Andhra Pradesh	161



Education and Economic Development

In the recent years as the new countries of Asia and Africa have turned to the tasks of national development, they are called upon to decide what priority to accord to investment in education. Should it have the very highest priority? Is education a prerequisite to all other progress? Or should a certain economic base be provided first? Only as increased production income is available does good education become possible. Only from this will there be wherewithal to support Schools and Colleges and Universities. Economic growth is necessary if a nation is to pay for Schools and Teachers.

This has been the crucial question. It has been decided in various ways. Sometimes education has been given priority. Sometimes other forms of expenditure—roads, airports, dams—have been put first because they seemed to constitute the most pressing needs. Sometimes to be sure there has been no choice. Everything has been attempted in principle and nothing much accomplished in practice.¹

In any planning process it becomes necessary to order priorities according to the needs of the people, in any particular stage in development path. Sometimes the purpose of investment plan gets lost in the technical complexity of means. In the early stages of development, sometimes, the clarity of

1. J.K. Galbraith, *Economic Development*, Harvard University Press, 1969, USA, p. 77.

purpose gets blurred and seems missing in the midstream of emotional upheavals. It is helpful to reflect on how the countries, privileged to lead, achieved economic advance, and met the challenges presented by development, succeeded in reducing mass deprivation, promoted popular enlightenment, and concentrated effort on growth, employment and redistribution.

Approaches to development need to be designed to increase, income earning opportunities, the public services intended to reach the poor, the flow of goods and services, and participation in development effort. Experience is a considerable teacher. If luxuries of the educational curriculum, esoteric educational institutions refined agricultural services, prefabricated housing and a wide range of public services are adopted before their time, they will draw resources and energies from the tasks that are strategically vital for development.²

Education as Investment

Education is an important aspect of level of living for fuller life, in poor countries it has definite effect on human productivity, and constitutes an important form of investment. Human productivity is a form of investment. Human productivity is a highly complex, abstract, open to many different interpretations. Education is one of the basic needs.

The basic needs approach spells in terms of health, food, education, water, shelter, transport, simple household goods as well as non-material needs like participation, cultural identity and a sense of purpose in life and work which interact with the material needs.³

Education is a kind of investment, like dam or canal, in which we invest to produce more in the future. Education as a form of investment has to be emphasised, needs to be

2. J.K. Galbraith, *Economic Development*, Harvard University Press, 1969, USA, p. 58.

3. Paul, Streeten, "From Growth to Basic Needs" in *Finance and Development*, September, 1979, p. 30.

expanded. All discussion in recent times tends to be concentrated on education reminding indifferent audiences that man does not live by bread alone, and enrichment of the mind is as important as the nourishment of the body.

People should be rescued from the serfdom of ignorance only in order to make them more productive. Studies by Theodore Schultz have recently shown that outlays for education may bring large increases in production, as a rupee invested in the intellectual improvement of human beings will often bring greater increase in national income than a rupee devoted to railways, dams, machine tools, or other tangible capital goods. The provision of power, transportation, to literate people is bound to be productive. There can be no effective advance if the masses of the people do not participate, as literacy is economically efficient. Hence popular education must come before machine tools, and it releases the energies of the many. Literate people will see the need for getting machines, hence popular education must have priority over the dams, factories and other forms of capital equipment, it emerges critically important.

In all countries of the World, it is seen that high per capita incomes are associated with high rates of literacy. Education is valued because it contributes to a better life.

India has held, on the whole, to the lesson of the nineteenth century, which is that education or education abetted by honest and orderly government, comes first. The sound instinct of the Indian Villager in wanting education for his children has usefully reinforced this wisdom.⁴

Any country placed on the development path, has to accept all the implications of education as a form of development investment. India invests only 6 per cent of what it invests in physical capital per capita (1973).

Student is the privileged object of the investment of scarce resources, the society has given some of its savings, and it is

4. J.K. Galbraith, *Economic Development*, Harvard University Press, USA, 1969, p. 81.

clear that he has obligation to return to the society, the increased production.

Education as a form of investment, must be responsive to the changing needs of the developing community, translated into curricula and courses. Sometimes criticism hits home, the courses of study taught in India, are not clinically concerned with the problems of Indian economy, for example medical education, based on foreign models, does not yield general doctors who can set a broken leg or prescribe some pain killer to the people in vast number of villages. We get expert doctors in city but no good doctors in rural countryside. The problem of investment is appropriate to the needs at lowest cost. It is argued that medical education has not been really adapted to the situation of a poor country.

Education in a developing economy has to be adapted to changing experiences, it is to be finely tuned to the objective of development. The accumulating experience has called for changes in the approaches. Experience is a considerable teacher. If we fail to learn from experience, we are only acting out comedy of errors.

Education as Consumption

Education is a superior consumer good, but still a consumer good, and has nothing directly to do with production. These, holding this view, insist on the priority of dams, fertilizer plants and Oil refineries. Education is a form of consumption, like bread or wine. When education is considered a consumer service, it becomes necessary to save on education. Savings are obtained from abstaining current consumption, and the axe falls on education in times of need for economising expenditure. It is a serious risk assigning education an unduly low priority. Some developing countries regarded steel mills, dams, and fertilizer factories as the tangible manifestations of development. In India, Bhakra-Nangal is the most respected form of development, that gets praise from visiting foreigners. This mistake requires to be corrected, and error has been universal.

The concept of "consumer sovereignty" applied to the student, suggests that at the age of discretion, he has the right

to study or not to study, and the choice lies with the student and not with the teacher. It is privilege of every individual to pursue the course of study of his choice. Talent gets distributed between engineering, science, medicine and agriculture. The students should not be forced into courses which they do not prefer. It is intensely difficult question as to how students are allocated to different courses. It becomes exceedingly difficult to provide courses according to their preferences, they are required to satisfy certain norms of admissibility, but serious thought should be given to the accommodation of students to need and preferences.

Cost of Education

The conventional costs of education consist of the costs of the services of teachers, librarians, administrators, of maintaining and operating the School, technically called the educational plant, and interest on the capital invested. Another component of total cost is the income foregone by students. The income foregone by the pupils constitutes one fourth of the total costs of education.

Total real costs of education = the conventional costs (direct and indirect) + the interest on the capital invested + the income foregone by the pupils.

The private costs of Education include, tuition fee, capitation fee, costs of books, notes and other stationery.

Education in the Third World

The educational systems in India, Pakistan and Bangladesh, are highly developed, giving an over production of teachers, administrators, entrepreneurs, even scientists and doctors, who are generally in short supply in the Third World. There is an ancient and still influential cultural base. . . . But the present system of education does little or nothing to encourage rural development. If there were to be the kind of transformation that appears to be essential for the future development, then education would have to undergo a profound change in order to play a key role in the transformation, where as the present educational system is perpetuating a deep rooted imbalance. . .

The balance sheet of the inflated educational system has a strong credit-side as well as the debits.⁵

The concept of education has broadened in recent years, and education was one of the human rights set out in the UN Charter. The aim of education is two fold, first is to raise the level of human skills, and second is to support economic growth, and it can be seen as an important key to the riddle of national economic development.

Primary Education in Third World

The cost of primary schooling is relatively high in these low income developing countries, because the salaries of the teachers constitute a large proportion of total real cost of education, and the standard of education is far below that of schools in advanced countries. The per pupil cost as a percentage of average income offers a rough indicator of primary education cost. It ranges from 10 to 40 per cent in developing economies as against below 10 per cent in Western advanced countries.

Even these poor countries are determined to have highly developed modern sector to provide apparatus for government, industry and economic development. Hence these countries started building modern universities. Therefore, educational system has dual role in providing for modern technological advance and wiping out the accumulating mass illiteracy.

The Functions of An Educational System

The basic function of education is to achieve full literacy, to enable the young people to read pamphlets, read local newspapers, and acquire skills to adopt appropriate techniques in agriculture, health, sanitation, and family planning.

Education and Social Change

Education contributes to social change at various levels, *i.e.*, family, office, factory, and administration etc. Social changes involve women, they are effected in their social status, the

5. Richard D' aeth, *Education and Development in the Third World*, Saxon House, D.C. Heath Ltd., England, 1975, p. 49.

traditional role of woman, *i.e.*, to feed the family, fetch water, look after the home and bring up children, has undergone a radical change. Education has enabled them to invade all spheres of economy including defence.

A small proportion of girls in developing countries go to schools, therefore, the pace of social change is slow.

Human Capital

Alfred Marshall emphasised the importance of education as a national investment, it is the most valuable of all capital, invested in human beings.

Although it is obvious that people acquire useful skills and knowledge, it is not obvious that these skills and knowledge are a form of capital, that this capital is in substantial part a product of deliberate investment.⁶

People invest in themselves and these investments are very large, and they enlarge the range of choice. Prof. Schultz says that our values and beliefs inhibit us from looking upon human beings as capital goods. Human resources should be explicitly treated as a form of capital. It is obvious that the differences in earnings (non labour income is not included) are usually explained by the differences in the amount of human investment. It is meaningful to treat education, like food, partly as consumption and partly as capital good. In some Western countries, human capital has been growing at a faster rate than non-human capital, the human capital component in the national income is very large as a consequence of human investment. Therefore education in a developing economy emerges as a critically important. The indicators of human resources development are, the size of the stock of human capital, and net additions to this stocks, *i.e.*, the rate of human capital formation, over a specified period.

Literacy is also a measure of human capital, and it is an important indicator of human resource development. The

6. T.W. Schultz—*Economics of Education*, Edited by M. Blaug, The English Language Book Society, Penguin Books, 1972, p. 13.

ratio of enrollment of Children in Primary Schools, to the actual or estimated population in the age group of 5 to 14 years, gives an indicator of human capital formation.

Difficulties in the Measurements of Human Capital

The measurement of human capital depends on some explicit and implicit assumption. The additions to human capital are the result of formal education, non-formal education, on the job training, experience, natural ability, social status or heredity and family income. It is difficult to make allowances for all these factors. Another difficulty is that one level of education leads to another so that the comparisons of those with primary education, and those without primary education, offer no competent conclusions.

Rate of Return to Educational Investments

The returns to educational investments are generally believed to be non-negative. The private and social rates of return continue to be large and hence schooling continues to expand. The private rates of return for Primary education in India range from 7 per cent to 25 per cent. (World Bank Survey, 1979, by Stephen P. Heyneman) Dr. Venkat Subramanian estimated at 39.6 per cent private return and 22.4 per cent social return on 5 years of schooling in 1978, and the average annual earnings of workers with primary education amounted to Rs. 2200 per year against Rs. 1400 per year of illiterate workers. The rates of return appear to be positive at all levels of education.

Considerable effort has been expended in defining adequate measure of return to educational investments. The problems of measurements became apparent in late sixties.

REVIEW OF EXISTING LITERATURE

Economics of Education—A Brief Survey of the Literature

Of late, economists have been spending considerable time attempting to assess the economic contribution of education and one of the hall-marks of the burgeoning literature is the variety of approaches that have been employed. The variety of stacks taken can be regarded as a tribute to the inventiveness

of the profession, as an index of the complexity of the problems or as an indicator of the fact that we simply do not know as yet how best to proceed.⁷

Four main approaches to the economic contribution of education are the following :

1. The simple correlation approach.
2. The residual approach.
3. The returns to education approach.
4. The forecasting—man-power needs approach.

The economists like Svernilson, Edding and Elvin, have correlated enrolment ratios and GNP per capita and have found that there is a positive correlation. A positive correlation can be viewed as evidence in support of the proposition that spending money on education is an important way of raising a country GNP. But the same correlation can also be viewed as evidence in support of the proposition that education is an important consumer good on which more is spent as GNP rises. The income elasticity of demand for education is greater than unity and that any negative substitution effect will be swamped by the positive income effect.⁸ Education is a long lived asset, and an educated man contributes more year after for the whole life. Schultz suggests the desirability of measuring the stock of education by weighting younger persons more heavily than older persons. If a country doubled its expenditure on education in year, the positive economic effects ought to be looked for all the years from $t+4$ year.

The residual approach consists of taking the total increase in economic output of a country over a given period of time. Advances in knowledge are usually regarded as the most important of the unspecified inputs. The rate of increase in an aggregate output series is compared with the aggregate input

7. W.G. Bowen, "Assessing the Economic Contribution of Education" in *Economics of Education*, Edited by M. Blaug, Vol. I, published by The English Language Book Society, 1972, p. 87.

8. Schultz has found that income elasticity of demand for education was 3.5 for US over the period 1900 to 1956.

series. Kendrick, the reputed economist of the National Bureau of Economic Research US has followed this procedure. Other contributors consist of Edward F. Denison, B.F. Massell, Domar and Solow.

An obvious way of studying the economic consequences of education is by comparing the life time earnings of people who have had more education with the life time earnings of people who have had less education. The difference can be expressed as annual rate of return on the costs involved in obtaining the education. This approach consists of looking at personal gain and national productivity. Calculating the rate of return on education is bound to produce erroneous conclusions because one level of education is a stepping stone to higher levels of learning. Education must be viewed as a series of related steps.⁹

The approach has many attractions. It is generally held that educational benefits are related to educational costs. Life time earning differentials are attributed to differences in intelligence, ambition, family connections and differences in the level of education attained.¹⁰ The education-ability-earning relationship has been reported by Wolfe and Bridgman. Denison found that one third of earning differentials are attributed to education differentials. It is difficult to make adjustment in the rates of return for differences in non-monetary advantages. The non-monetary advantages accrued to the individuals would increase their welfare.

The direct returns to education will not reflect the external economies, which would raise the level of real income and welfare generally. The economic contribution of basic research is difficult to assess. Education is a source of present and future pleasure.

Some economists have tended to regard educational outlay as consumption expenditure. It is exceedingly difficult to

9. Burton; A. Weisbrod, 'Education and Investment in Human Capital' has found that rate of return on school education ranged from 35 to 52 per cent.

10. Becker has standardized data for differences in ability. He found 9 per cent rate of return on the educational outlays.

estimate consumption component of educational outlay. The process of education will give two end products, *i.e.*, Professional competence and pleasure. It is the case of joint cost. Denison found that the rate of return on college education is about the same as the rate of return on private investment. Predictions for future rates of return are difficult because much depends on the quality of students, the student entering the educational institution may turn out to be an academic failure or an Einstein, it is impossible to foresee future discovery and advancement in knowledge, and education asset will last long. In spite of its limitations, this approach has its attractions, *i.e.*, it permits comparisons of costs with benefits, it permits us to examine the effect of ability differentials on earning differentials.

The man power studies often culminate in recommendations that are useful to the practical policy maker. The man power projections will guide the important policy decisions. It is helpful to reflect on how much resources are devoted to man power training. The present and future needs of the country ought to be assessed and benefit cost analysis will not provide much guidance.

Over-View of Literature in India

Education is an industry, comparatively a new slogan in the field of education.¹¹ This comes out of the study of regular business of input from the industry. The consideration of its varied aspects makes the problem of economics of education challenging because of its controversial productive efficiency of the investment of capital and/or labour. It is more so because of various claimants on the limited resources of the national economy and education claims a considerable segment of the national budget, it has to justify its claim in terms of its productivity and contribution to national economic growth.

The subject, as such, is of recent origin. The economists had a long standing positive interest in the relationship of economics and education, but it was only in fifties that there

11. M.B. Buch, *A Survey of Research in Education*, published by the Centre of Advanced Study in Education, M.S. University, Baroda, 1974, p. 514.

was a large spurt in the growth of literature. Blaug reports that upto 1951, there was only fifty five pieces of literature, the production from 1951 to 1956 was fifty three, but during 1956-60, it was 200 and during 1961-66 it was 500. The growth of literature reflected the growing interest of the economists in education.

The major areas of study have been the exploration of the contribution of education to economic growth, differential significance of educational specialisation in terms of individual earnings, cost benefit analysis, and relationship of schooling and on the job training, with the earnings.

There have been a few studies in this field in our country but research tradition has not been developed much in this field. It is helpful to reflect on the growth of literature in this field. The first attempt was the seminar on "Education as Investment" in 1966 at the Department of Economics, Lucknow University. Another seminar was on "Measurement of Cost, Productivity and Efficiency of Education" in 1967, organised by the NCERT. In both these seminars, a large number of papers were presented, in which new concepts and new terms of economics of education were used. The economics of education has begun to gain popularity at slow pace. Four important studies have been completed during the year 1959, 1961, 1962 and 1965. Some more studies have been completed during the period 1967 to 1972. The economists have taken more interest in this field than educationists. The nature of studies and technical treatment of the subject varied from time to time.

The studies, according to Hansen, fall into seven categories as follows :

1. Human capital approach.
2. Education's contribution to economic growth.
3. Impact of education on earnings.
4. Historical studies.
5. Relationship between education and earning.
5. Programme budgeting and financing of education.
7. Efficiency and equality of educational opportunity.

The studies in our purview show three clear groups :

1. Educational Financing.
2. Education and Productivity.
3. Costs of Education.

Educational Financing

Educational Financing has proved to be the most popular field of research in this area. Seven studies have been reported. Four of them are at doctoral level and three are project reports. The contributors are Misra (1959), Nair and Pillai (1962), Karnik (1967), Shah (1969), Panchamukhi (1970), Azad (1972), and Karnik and Pandya (1972). The main trend of the research has been to treat the problem from an administrative and historical standpoint. It is Shah's study (1969) that has met the technicality of the subject treatment. The other trend is to pose the problem of finances in education in the prevalent practice as revealed from the government reports. As such these studies differ in their nature. While Misra (1959) has studied finances of Indian education during (1898-1959), Nair and Pillai, Karnik and Pandya have dealt with problems of Finance, in their respective States, Kerala and Gujarat, Karnik's (1967) study is mainly a survey of growth of education in terms of enrolment, budget allotment and number of institutions at different levels. He has used about forty indices of economic growth and assessed the resultant change. The studies, afterwards have tended to be unwieldy become critical and deep on particular aspects of the problem. Shah (1969) has dealt with the fund allocation and growth in expenditure in terms of constant prices. Azad's study concentrated on financing the higher education. He has also analysed it in terms of constant prices.

Education and Productivity

The second group of studies in general are on education as a correlate of higher productivity. Of course there are variations in the nature of studies. Sinha (1967) dealt with the various concepts of economics of education along with contribution of education to economic growth of Bihar during Five Year Plans. Datta (1970) was interested in ascertaining the relative influence

of inputs on student output, or college environment. Singh (1965) and Chaudhari (1968) were interested in observing contribution of education in industrial and agricultural productivity respectively. Regarding the conceptual aspect of the discipline, it is definitely still in the making. Presently standard definitions of certain economic terms are being used. The economic concepts have been imported into education. Chandra's (1972) definition on saving aspect and hoarding aspect of education provides one of the best examples. Education as investment is being treated by various authors. The allocation of funds to education requires proper attention. The studies by Mukherjee and Rao (1966) are worth mentioning. These studies focussed on relative efficiency of different levels of education and subject groups in respect of the output returns. Some researches on the theoretical aspects are also in the offing.

Costs of Education

The rest of the available literature is in the field of costs of education. Shukla (1960) studied some problems related to technicalities of the discipline. He studied the differential cost of basic and non-basic schools. Mathur (1968) has made a similar attempt. It has been a study on the public cost of education and also dealt with financing of education. Kamat (1968) study was on institutional cost in higher education, and it tended to take a specific approach. He has studied the institutional cost in terms of expenditure per pupil per annum in the University of Poona. Srivastava and Sen (1970) studied the utilisation of money by the tribal students, only study on the backward community. In the late sixties, Sen undertook a study on cross-sectional survey of Calcutta metropolitan area, dealing with cost of education, 'The relative output and effect of education on earnings'.

The field of economics of education is being continuously explored by a few organisation, *i.e.*, NCERT, the Economics of Education Unit of Bombay University, the Gokhale Institute of Politics and Economics, and the Department of Economics of Lucknow University etc.

Kothari Commission

The Kothari Commission (1964-66) considers education as an important factor in man power planning for a planned economy. The success of planned economy depends upon the development and proper utilisation of human capital. The commission depicts a grand structure of education which will provide trained man power for the growth of national economy through vocationalisation of education at Secondary level. The commission recommended that work experience should be introduced as an integral part of all education.¹² The role of education should be to increase productivity, achieve social and national integration, strengthen democracy, accelerate the process of modernisation and cultivate social, moral and spiritual values. According to Kothari Commission, the primary education covers pre-primary, pre-basic, Kindergarten, lower primary, primary and junior basic schools. The education at primary level extends to 4 to 6 years of schooling, beginning from 5 years of age of the child.

The standard of education largely depends on the quality of teachers interested in teaching profession. The teacher training should be treated as a key area in educational planning at State and Central levels. The report made it clear that every teacher in a primary school is already trained at the time of appointment or receive such training within three years of appointment.

The commission favoured the introduction of free and compulsory education for seven years as effective general education. The commission has given time bound programme that effective primary education should be provided to all children of school going age, *i.e.*, from 5+ to 10+ years by 1975-76. (It may be mentioned that as per present indications this target may not be reached even by 1985-86).

The recommendations of the commission include abolition of tuition fees in all primary schools including private aided schools. (It is no wonder that the private primary schools are reported to be collecting tuition fees and donations in all

12. Suresh Bhatnagar, *Kothari Commission, (Recommendation and Evaluation)* published by International Publishing House, Meerut, 1967, p. 6.

the States). The commission recommended that free text books and writing materials should be supplied to the students in primary schools to cut private costs, to "negligible size as an incentive to attract more children to primary education. Our country is poor and the percentage of poverty is high, in the age of competition a poor person cannot enjoy the opportunity meant for him. Our educational policy has been concentrating on the top of a heavy structure with weak base. Equality of educational opportunity should be provided to all. The education system should also provide experts to crucial sectors of the economy.

Education system should be able to supply a sufficient number of educated persons for the economic development of the country".¹³

Andhra Pradesh—Important Socio-Economic Indicators

Andhra Pradesh was formed on 1-11-1956, as a consequence of reorganising States on linguistic basis. Two regions, *i.e.*, Andhra region with eleven revenue districts of Srikakulam, Guntur, Cuddapah, Kurnool, Visakhapatnam, East Godavari, West Godavari, Krishna, Anantapur, Nellore and Chittoor (Area 63,608 Sq. Miles) and Telangana region, with nine revenue districts of Hyderabad, Medak, Nizamabad, Mahboobnagar, Nalgonda, Warangal, Khammam, Karimnagar and Adilabad (Area 42,433 Sq. Miles), were merged into new enlarged State of Andhra Pradesh (Area 2,75,068 Sq. Kms.).

People

In 1951 the population was 311.15 lakhs, it rose to 359.83 lakhs in 1961. In 1971 the population of the State was estimated at 435.03 lakhs and in 1981 it reached 535.93 lakhs. During 1961-71, the growth rate of population was 2.09 per cent and during 1971-1981 it rose to 2.32 per cent. Density of population in 1981 was 195 per Sq. Km.

13. Kothari, "Economic Issues in Education Policy" in *Educational Psychology Review*, Jan., p. 8.

Literacy

Andhra Pradesh ranked 10th in literacy according to 1951 census, maintained the same rank in 1961. In 1981 census (provisional), it moved up to 8th rank in literacy.

<i>Year</i>	<i>Literacy rate in Andhra Pradesh</i>
1951	13.1
1961	21.2
1971	24.6
1981	29.72

Rural and Urban Population

Rural population consists of 76.75 per cent as against 23.25 per cent urban population in 1981. In 1971, urban population was 19.31 per cent and rural population 80.69 per cent. During the period 1971-81, when the overall growth rate was 23.19 per cent while the rural component has shown a growth rate of only 17.19 per cent.

Number of urban units in Andhra Pradesh are given below :

<i>Year</i>	<i>Urban units</i>
1951	291
1961	212
1971	220 (pro.)
1981	234

The number of villages in Andhra Pradesh at 1971 Census was 27221. The number of class I cities with more than 100000 population was 20 in 1981.

Work-force

Number of workers increased in Andhra Pradesh as shown below :

<i>Year</i>	<i>No. of workers</i>	<i>Work participation (percentage)</i>
1961	18663042	51.87
1971	18874361	41.39
1981	2672939	42.18

It is noticed that work participation rate declined from 51.87 per cent at the 1961 to 42.18 per cent at the 1981 census. The definition of the term 'worker' has undergone a change during these three censuses. Nearly 37 per cent of the population consists of agricultural labour.

Woman Participation in Work

Women participation in work has declined during three censuses both in urban and rural centres. This might have been consequence of definitional error.

<i>Year</i>	<i>Rural female participation</i>	<i>Urban female participation</i>
1961	46.00	18.74
1971	27.37	10.54
1981	32.85	11.11

School Age Population

The demand for schooling depends on population of the children in the age group of 6 to 11 years in primary education. The simultaneous choice of schooling and work by the pupils does not arise in primary education.

In 1971, the population of the children in the age group of 6+ and 10+ years works out 13.13 per cent (6.71 per cent boys, 6.42 per cent girls). The children in the age group of 11+ and 13+ years works out 5.08 per cent of the population (2.57 per cent boys, 2.51 per cent girls). In aggregate 18.21 per cent of the population consists of children in the age group of 6+ and 13+ years.

Revenues of the States

The economic development of the State depends on resources. The revenues of the State have grown from Rs. 38.44 crores in 1956-57 to 1000.83 crores in 1979-80. The growth of state's revenues is shown on p. 19.

The per capita revenues of the State showed increasing trend during the period.

<i>Years</i>	<i>Revenues of the State (Rs. in crores)</i>	<i>Per capita revenue in the State (Rs. per annum)</i>
1956-57	38.44	11.35
1960-61	85.29	23.70
1965-66	151.79	38.14
1970-71	296.26	69.13
1975-76	505.37	105.16
1979-80	1000.83	187.41

Compulsory Education

Primary education was made compulsory in select areas of every district. The department adopted persuasive methods to bring the children to schools. The progress of universal free compulsory primary education in Andhra Pradesh is shown in the statement below :

<i>Years</i>	<i>Enrollment of boys</i>	<i>Enrollment of girls</i>	<i>Total</i>
1956-57	1544039	910015	2454054
1960-61	1840664	1135391	2976055
1965-66	2245983	1523191	3769174
1973-74	2391050	1639032	4030082
1974-75	2425538	1656536	4082074
Percentage increase over 1956-57	57.09	82.03	66.34

It is encouraging to note that percentage growth in the enrolment of girls was higher than boys during the period under consideration. Universalisation of primary education remained utopian ideal. Conceptual failures, skewed priorities, inadequate financial allocation characterise official endeavour to universalise primary education.¹⁴

14. *Indian Express*, 25 February, 1982, Editorial.

State's Responsibility

The State shall endeavour to provide within a period of ten years from the commencement of the Constitution free and compulsory education for all children until they complete the age of 14 years (Article 45 of the Constitution).

Educational Surveys

According to the First Educational Survey only 68.40 per cent of rural population was served by primary education in March 1957. According to Second Educational Survey 87.18 per cent of rural population was served with primary sections. Girls constituted 40.37 per cent of the enrolments. The percentage of enrolment was 75.08 per cent, estimated population of 6+ to 10+ age-group. Only 38.71 per cent of primary sections had their own buildings. 25.18 per cent of schools consisted of rented buildings as against 50.77 per cent rent-free buildings.

Fourth All India Educational Survey provided some interesting information about Andhra Pradesh. The number of villages, *i.e.*, 29408, were divided into 324 blocks or taluks. The total number of primary schools was 47957 classified into Government Schools, Schools under Panchayat Samitis or Zilla Parishads, Private Schools, and Private Unaided Schools. Nearly 92 per cent of rural population was provided with primary schools. It was noted that habitations with 300 population were served by primary schools. The enrolment in classes I to V was 4925484 and the enrolment of girls was 2024159, *i.e.*, 41 per cent during the reference year as per Fourth Educational Survey. The estimated child population in the school age-group rose from 5651000 in 1973 to 6419000 in 1978, an increase of 13.6 per cent.

The Aims and Objectives

The broad aims and objectives of the study may be stated in brief as follows. The construction of objectives largely depends on availability of data and access to data source.

The study is directed to determine per pupil expenditure per year and identify the trend in public expenditure on primary

education. The study aims at establishing the possible relationship between expenditure on primary education and other economic variables like national domestic product, literacy rate and productivity in agriculture. The study is likely to give some projections of demand for teachers. A plan for the removal of illiteracy in the State is proposed to be given.

Methodology Adopted

The study largely rests on primary source for educational statistics. The Investigator found it difficult to find published source of information. The statistical section in the office of the Directorate of the School Education, Hyderabad, Andhra Pradesh has been contacted. From the office records most of the data are collected. Where data are not readily available, some estimates on the basis of past experience have been made. The data on expenditure are collected in respect of primary education. The opportunity cost in the primary schools has been computed on the assumption that it forms one fourth of the public expenditure. Interest has been calculated at the rate of ten per cent per annum over previous year's expenditure. The wastage rates, computed are based on the assumption that there is no fresh enrolment in classes II, III, IV and V. The children in the age group 6 to 11 years are estimated given the percentage of enrolment in primary schools.

Schooling—Utility Analysis

Schooling affects utility directly. The marginal cost, consists of time spent in school, while the benefits will include the effects of schooling in enhancing future consumption of leisure and goods.

A person with low earning ability with high opportunity, or with a short expected work (or consumption) horizon may find that the marginal costs exceed the marginal benefits even at zero level of investment. He will choose not to accumulate additional schooling.¹⁵ An individual can increase his schooling while holding current leisure constant (An explanation why the

15. Yoram Weiss, Arden Hall, Fred Dong, "The Effect of Price and Income on Investment in Schooling", *The Journal of Human Resources*, Vol. xv, No. 4, Fall, 1980, p. 616.

379
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parents of children from tribals, and weaker sections refuse to send their children to schools). The children's contribution to family earnings is negligible. Families without adequate income care have little security for future except for reliance on their children. As incomes fall demand for future leisure will decrease with the level of schooling. The negative slope of the marginal benefit curve reflects the decreasing marginal productivity and affects changes in future work effort as level of schooling increasing (the explanation for wastage in education is seen here).

Schooling—Cost Benefit Analysis

Many difficulties are encountered in the cost estimation of education. It is difficult to identify that portion of expenditure on primary education out of aggregate public expenditure on the offices of Directorate of School Education and Inspectorate of School Education. The estimate of opportunity cost, *i.e.*, incomes foregone by the pupils during the period of school attendance, is not free from risks. The opportunity cost is likely to be affected by a financial treatment of the income transfers. The opportunity cost is not directly observable. The direct costs of education are not separated from quality differences.

The benefit cost analysis measures the gains and losses of same action in terms of the resulting changes in aggregate terms of the resulting changes in aggregate consumer and producer surpluses.¹⁶

When evaluating the net benefits of a scheme, the benefits accruing to each member of the relevant group should normally be added without regard to the individuals to whom they accrue.

The efficiency analysis of the scheme or project, will enable the decision making authority to make trade off among efficiency and equity. Another welfare indicator is to combine efficiency and equity, by attaching different weights to the gains or losses of different groups.

Costs are to be incurred if benefits are to be achieved.

16. The Economic Record—September, 1976, "Cost Benefit Analysis and the Theory of Public Finance" by Musgrave, Rihcard A.

Approaches to Human Capital

The concept of human capital is rapidly gaining importance. It is not possible to trace the take off point of a new concept. There has been a sudden proliferation of publications concerned with the concept of human capital. These publications provide a telling illustration of the new vistas opened up by the concept of human investment. The concept of human capital was explained by several important writers. Some objections have been raised against the idea of human capital, because of its peculiarities. Education as a form of investment may be distinguished from education as a form of consumption. In economics as in other social sciences, it is not easy to be both useful and uncontroversial. Every thing or an idea has an element of controversy, so also the concept of human capital.

People acquire useful skills and knowledge and they are a form of human capital. The quality of human effort is greatly improved with the use of human capital, which accounts for the impressive rise in the real earnings per work hour.

We now recognise the importance of promoting equality of opportunity, that implies the continuing financial support for the students, in more than one part of the education system. This pattern of subsidy is regarded as continuum. A broad consensus on the need to expand educational opportunities in poor countries, has been reached in several academic conferences over the last five decades. Education has no political axes to grind and no ideological banners to wave.

At low levels of income, it is a long painful process to accumulate the critical mass to skilled human resources, the only productive capital in the initial stages of development that will ignite accelerated and sustained economic growth. Despite lagging per capita income growth, the levels of education in low income countries, have been rising fast. This happens because of continuing awareness to the need to expand educational opportunities, in an effort to increase the stock of human capital. This will affect growth prospects and quality of life. The focus of attention was to be more concentrated on human resource development. The experience of the developed countries has highlighted the need for increasing level of investment in human resources. There has been some frustration coming out of seeming discomfort with the traditional, institutional hurdles in the way of improved scientific bias towards more education budget allocations. The quest for economic respectability for educational projects resulted in stifling of thinking about the new approach to human resource development. With respect to education, the cause of equal education was felt to be damaged by the fact, it had been argued on the grounds that it would lead to improved earnings rather than that it was some thing that all persons had a right to. Education is seen as helping the individual and society to move from a traditional to a more modern condition and as fostering knowledge and skills, and values for modern technological advance, production and consumption.

With all its empirical sophistication, the essence of human resource development still eludes contemporary theories. The crucial variables making up such attributes as trust, compassion, curiosity, and initiative remain poorly understood. Beliefs, values, self-discipline, self-sacrifice and dignity are mostly attributable to the environment. Each school of thought delivers only a part of the "Truth", and man is shaped by the premise underlying each theoretical proposition. Knowledge grows out of knowledge not out of information.¹

1. Graham R., Little—"Creativity and Conflict in Psychological Science", *Impact of Science on Society*—UNESCO 134/135, 1984.

We are eternally caught in this supreme struggle and we must embrace as brothers each supporting the other in confronting true foe, our collective ignorance. Knowledge dispells the darkness of ignorance. The past illuminates the path to future. This discussion places a great emphasis on human capital development. It is necessary to understand the distinct features of human capital.

HUMAN CAPITAL AND PHYSICAL CAPITAL

Knowledge embodied in a person is like physical capital, yields income. Human capital, unlike physical capital, has no observed market value. Human capital, the services of knowledge and skills embodied in a person, is traded in labour markets, technically may be regarded as rental markets. Human capital, knowledge skills embedded in human agents of production, like physical capital equipments is to depreciate after critical age. Depreciation, defined as negative changes in capital value depends upon the age of a person possessing knowledge and skills, does not depend on chronological time like physical equipment. Depreciation of human capital occurs as a result of increased probabilities of death and general deterioration of mental and physical capacities of a person. Acquisition of knowledge or learning, as the embodiment of a portion of existing knowledge unlike the acquisition of physical good or investment does not preclude others from acquiring it. Gross learning continues up to the critical age and individuals also learn from experience. Human capital like physical capital has obsolescence, defined as negative changes in capital values, that are function of chronological time it occurs because, the values of stocks of knowledge changes from time to time. Acquisition of knowledge like acquisition of physical property is not free and it requires the expenditure of resources, money, time and effort. Human capital is growing faster than physical capital. The investment in education is an ill liquid asset.

Human capital like physical capital entails maintenance, the medical care and health services are concerned with the repair and maintenance of human capital. The tax laws of any country neglect this fact that human capital requires maintenance and repair. Human capital deteriorates during the periods of

idleness and unemployment it impairs the skills and knowledge already acquired. Human capital cannot be continuously employed.

Hence, it is necessary to reduce the volume and period of unemployment in order to prevent this deterioration of human capital. Losses in earnings during the periods of unemployment, may be compensated by an appropriate system of doles, but these payments cannot be expected to avert the deterioration of human capital during unemployment. Hence, employment alone prevents the deterioration of human capital. But the choice of profession is limited by certain factors, education and training, religion and region, and laws. The Bank loans are not secured for investment in human beings, but they are readily available for investment in physical goods, the dynamics of economic progress contributed to the movement of labour force from agriculture to industry and from rural to urban. Human beings in late thirties cannot afford to migrate because the remaining pay off period is short. The earnings of farm people in general are low. There has been substantially low investment in depressed and under-privileged classes of people. The over-investment in some skills will lead to unemployment. The under-investment or over-investment is a matter of serious public concern, both have political and social consequences. There has been general under-investment in human beings as compared to physical goods. The public investment in goods can be transferred to individuals, but the returns from public investment in human capital accrue to individuals in whom it is made. Hence, public investment in human capital is to be treated differently. A welfare goal may be reached by increasing public investment in education, it is the effective tool for achieving more equal distribution of income. In many poor countries the investment in human capital is under-rated or neglected. Hence, there is a need for increased assistance from international aiding institutions to the poor countries for investment in human resource development projects.

The direct expenditure for the improvement of man is not investment in economic sense because it satisfies wants directly. The investment in man is done not with anticipated monetary

returns. The expenditure on education will have positive influence of indeterminable magnitude on man's efficiency. The earning power of man is not a saleable commodity, while the physical capital is saleable in the market. The present capital value of future personal earnings has no financial meaning. The cost of schooling includes private expenditure, public expenditure and opportunity cost. The amount of education is a matter of personal choice.

Knowledge has a property characteristic and hence it has a rental market value. Education is a general efficiency parameter, and it may influence the productive capacity of a person in all sectors and increases the ability of a person to acquire more and better knowledge, there seems to be two way relationship between education and ability of a person, knowledge is not the product of educational institution alone, and learning ceases not after formal school years.

Gross learnings function in given below :

$$Z_t = (h_t - h_{t-1}) + \delta h_t$$

Where Z_t = Gross learning.

h_t = Stock of knowledge embodied in a person.

δ = rate of depreciation.

Gross learning equals a change in the stock of knowledge plus depreciation. Z_t is always positive upto critical age and takes negative values after that. Learning also depends on mental ability, equation is given below :

$$Z_t = \alpha A + \beta S + \mu$$

Where Z_t = Gross learning.

A = innate ability of a person measured in terms of IQ.

S = number of school years.

$\alpha \beta$ = Parameters to be estimated.

μ = error term.

If $S = 0$, gross learning is a function of informal education. Under no known instances A can be zero.

$A > 0$ A is always positive.

Education affects ability, a single composite index and ability is a factor necessary to acquire knowledge. The following learning function is also useful :

$$Z = \alpha I^{1-\beta} h^{\beta}$$

Where

Z = gross learning.

α = general efficiency parameter, a measure of all-round, ability.

β = relative marginal product of knowledge.

h = Stock of knowledge.

I = Index of learning opportunities. Here comes the role of educational planning. Educational planning is expected to remove inequalities of learning opportunities.

Learning in true sense implies investment. People invest in themselves and these investments are large. Man is the end to be served by all economic endeavour, and he is not property or marketable asset. By conventional reasoning human beings are not looked upon as capital goods. Our failure to treat human resource, as a form of capital is formidable. It has fostered the retention of classical notion of labour as a capacity to do manual work requiring no knowledge or skill. Modern theories tend to neglect this notion. Now the labourers may be regarded as capitalists, because they possess knowledge and skill that has economic value. The differentials in earnings are largely sought to be explained by the differentials in education. The socio-economic status SES may not be taken as a single explanatory variable in the earnings function and return estimate. The SES is a composite variable, it may be split into two, social status defined by caste or group, and economic status meaning average annual family earnings. It is possible to find out by deep research which variable is a dominant factor in determining earning differentials arising out of ability differentials based on education levels. The model developed by Becker and Mincer may be summarised as follows :

The earnings of i th person at a time t can be written as

$$E_{it} = E_{i0} + \sum_{j=0}^{t-1} r_{ij} C_{ij} \geq 1$$

Where

E_{it} = the earnings of i th person at a time t

E_{i0} = initial earning.

r_{ij} = return.

C_{ij} = Costs.

The assumption that second part of the equation i.e., the summation of earnings is greater than one is apparently realistic.

$$E_{i0} + \sum_{t=0}^{t-1} r_{ij} C_{ij} \geq 1$$

The cost of investment as a proportion of potential earnings may be denoted as K_{ij}

$$C_{ij} = K_{ij} E_{ij} \quad \therefore K_{ij} = \frac{C_{ij}}{E_{ij}}$$

By substitution, the equation can be written.

$$E_{it} = E_{i0} + r_{i1} K_{i1} E_{i1} + r_{i2} K_{i2} E_{i2} + \dots + r_{it-1} K_{it-1} E_{it-1}$$

Where r_{ij} = rate of return and C_{ij} is the cost of investment by i th person in j th period. In the final form taking natural logs.

$$\ln E_{it} = b_0 + b_1 g_{it} + b_2 g_{it}^2 + b_3 \ln w_{it} + r \sum_{j=1}^S K_{ij} + U_{it}$$

Where U_{ij} is the residual, labour force experience 'g' is measured from first full time job after high school.

S = number of years of college education.

$r K_{ij}$ average rate of college investment.

w_{it} = number of weeks worked.

In the model the returns are assumed to be financial earnings only. Other non-economic benefits are ignored.

Dimensions of Human Capital

Education like food is partly consumption and partly investment. The human capital plays an important part in modern production. In the past decades there has been over emphasis on physical capital. In estimating war damages, only physical capital was taken into account, and human capital was

ignored. This was a fatal mistake. Human capital has two dimensions, quantity and quality. The quantity of human capital is measured by number of people and number of hours worked. The quality dimension of human capital is represented by skill, knowledge and human capabilities.

Expenditures

There are conceptual and practical difficulties in estimating the magnitude of human capital. There are three types of expenditures :

- (1) The expenditure that satisfy human preferences may be called pure consumption. Education enables a man to enjoy consumption of education.
- (2) The expenditure that will enhance human capabilities is a form of pure investment.
- (3) The expenditure that has both effects is partly consumption and partly investment. In this the task of identifying each component is formidable. Education creates a form of consumer capital which improves the taste and quality of consumption throughout life.

Determinants of Human Capital

There are various activities which promote the formation of human capital.

1. Health Services

The expenditure on health services will affect two dimensions of human capital. The number of people will increase as a consequence of increased life expectancy, reduced infant mortality, reducing the incidence of diseases and improved health standards. The improved health standards will enhance the capabilities of a man, enabling him to acquire more and better skills and more and better knowledge.

2. On the Job Training

The employers will provide in service training to the employees. This training will help them acquire more and better methods of production. The cost of on the job training will be realised through improved productivity gains.

3. *Formal Education*

The organised institutional education will increase human capital. The informal education will also improve human knowledge. The investment in education has been rapidly rising. The total cost of education includes direct cost, like services of teachers, librarians, administrators, and interest on capital invested in educational plant. The direct private costs include cost of hostels, books, notes, uniforms, and transport. The income foregone by the students during school years forms a substantial part of the total cost of education. This income foregone by the students during the period of school attendance was estimated at 25 per cent of the total cost. The income elasticity of the demand for education is high in all countries. The stock of human capital and education have been rising in all countries, during the past decades. The estimates of stock of education are incomplete. It is difficult to take into account the full increase in the average life of human capital. A large part of the stock of education is held by the young people, in poor countries. The estimate is incomplete because no adjustments could be made for improvements in human capital, overtime. The stock of education was estimated at 42 per cent of the physical capital in 1956.

4. *Study Programmes*

These study programmes are organised by the firms. They include extension programmes in agriculture. These programmes are intended for improving human capital. They play an important role in transmitting new knowledge and skills.

5. *Migration*

There has been migration of people from one region to another region in the world. Migration is the consequence of adjustment with changing job opportunities. Even within the country migration takes place, because people move to other regions in search of better opportunities. The theory of sons of soil is causing a movement to prevent international and internal migration. The public investment in education is not economically sound because of mobility of highly educated

labour. This is giving rise to the problem of 'Brain Drain'. Most education is produced outside the market mechanism. Hence, migration cannot be prevented.

OPPOSITION TO THE APPLICATION OF CAPITAL CONCEPT TO HUMAN BEINGS

Mr. H.G. Shaffer strongly opposed to the use of human capital concept. It would create confusion and lead to more problems than it would solve. Human preferences are in general uniform, for example we prefer peace to war, we prefer freedom to slavery, we prefer knowledge to ignorance, and we prefer health to illness. These preferences will guide investment policy. There is no financial wisdom in treating expenditure on education as investment, because it is difficult to distinguish between economic welfare and non-economic welfare. It is difficult to separate consumption expenditures from investment expenditures. For example a substantial part of the expenditures on food, clothing, recreation, entertainment, luxuries like TV, refrigerator, air coolers etc. may be treated as investments. Any expenditure that tends to increase man's efficiency may be called investment. But it is difficult to identify investment component of such expenditures because they also satisfy human preferences. According to classical notion labour was treated as homogeneous factor of production and the units of labour in human beings are assumed to be identical. This assumption is not realistic. No two men are identical and not even brothers. The advocates of human capital concept heavily depend on this assumption. The income differentials were sought to be explained by educational differentials. The amount of education is to be measured by the number of years of school study. But it ignores the quality aspect of education. For example four years of study in secondary education does not match with the college study of four years. The difficulty cannot be surmounted by use of any mathematical model.

The choice of profession is a significant factor influencing the earnings of a person. The experience confirms our belief that the choice of occupation is dictated by socio-economic status. Hence, the earnings differentials can not be explained by education. Keeping other factors such as social connections,

dwelling region, occupation, culture, level of income of the parents and health, constant. These factors have definite bearing on human capital. The law of diminishing returns was applied to capital. The yield on successive additional capital, *i.e.*, marginal efficiency of capital would diminish. So the returns on additional education would diminish. Hence, the investment in higher education is not economically sound. It ignored motivation factor. People are motivated for higher learning not for monetary returns. Higher learning is wanted for social status also. The higher education of women may not be economically sound because most highly educated women do not enter into labour market. In labour surplus economies, a significant part of the human capital remains unutilised or underutilised because of growing educated unemployment. Despite falling returns on higher education, the expanding investment in higher education cannot be resisted. In open university system, the adult students pay their own expenses. A part of their income is spent in learning. This expenditure is undertaken to achieve satisfaction from higher education. There is no cause and effect relation between education and income. The maintenance costs of human capital continue even after the period of investment. The expenditure on dress and hair cuts, is necessary not for increasing earning power, but it is connected with higher education, because the absence of it may cause anxiety or loss of tranquility which interfere with educational achievement. The expenditure on expensive car, well furnished home, and dry cleaned shirts and other luxuries connected with the retention of position which yields income, may be treated as investment. The expenditure on education is for education as pure consumption good. We confront with the formidable task of separating consumption from investment in all types of expenditures on food, housing, improved medical care, and recreation facilities.

SUPPORT TO HUMAN CAPITAL CONCEPT

T.W. Schultz has stoutly defended the use of capital concept to human beings. There are difficulties in identifying the components of consumption and investment in other expenditure

for example when a farmer uses car, a part of the expenditure may be treated as farm expenses, so also, a doctor, lawyer, a business executive, no one has invented a satisfactory empirical procedure for identifying or measuring each component of expenditure. If education were free, then people continue to consume it till they reach a point of full satisfaction and additional education will not yield any increase in earnings. The private expenditure is less than total cost of education hence return on education to the extent of private cost, is certainly greater than return on total expenditure. So the private incentives to consume and invest in education are affected by public expenditure on education. Some education is for consumption. But vocational higher education like engineering, medicine, law and nursing is surely investment. People are motivated for acquiring these skills to enhance earning capacities. The capital market does not serve human investment, hence there are imperfections. Most investment in people, is a long period capacity, long life and is subject to uncertainties. People face serious uncertainty to invest in themselves. Our tax laws discriminate against human investment. There are certain economic responses to human investment. The consumption of education is different from consumption of food or a house. Education has two parts—future consumption component and future earning component. Education is a durable consumption good yielding services that satisfy human preferences, and is a source of future utilities. The other component is investment like investment in a house, or an automobile. Education is for current consumption, future consumption knowledge and skills. Education is a major source of economic growth. The society will deny advanced education to women because most of them do not enter into the labour market. Education is an investment in people to the extent that it will improve their capabilities and future earnings. The difference in education is a major explanatory variable for differences in income of the people.

Earning Functions

Yaari assumed that a consumer aged t with probability $P(\pi/t)$ of surviving to age π and a maximum life time of T , would have expected utility integral.

$$V = \int_t^T p(\pi/t) \alpha(\pi) \mu[c(\pi)] d\pi$$

Where $c(\pi)$ is consumption at π .

$\alpha(\pi)$ subjective discount factor.

Rate of time preference = $1 - p(\pi/t) \alpha(t)$.

Expected life time $\mu(t) = \int_t^T p(\pi/t) dT + t$.

t = age of the consumer.

T = Maximum age.

π = Age of the consumer at death.

t = actual age of the consumer.

$\mu(t)$ = expected life time.

Human capital may be measured by the life time earnings. The earnings of a person change in proportion to the amount of human capital.

The earning function may be given as follows :

$$X_t = R h_t$$

Where

X_t = earnings of a person at age t .

R = implicit market rental price of the knowledge and skills.

h_t = index of knowledge.

By re-arrangement it can be written as

$$R_t = \frac{X_t}{h_t}$$

It is not difficult to construct an appropriate instrument to measure.

So, the implicit rental value of human capital is the ratio of gross earnings and index of knowledge. It is possible to compute total gross earnings of a person. The average annual

gross earnings of a person may be called rental value of human capital. The age earnings profiles may be constructed. Researches in this area have brought additional information. As man reaches maturity, the average annual earnings tend to increase, and this increasing trend continues upto the age of retirement, after which the earnings start diminishing.

In most cases after the age of 60 years, the earned income tends to decrease. The income differentials are explained by age, skill, maturity, and investment in human capital. Several attempts have been made to evaluate the stocks of human capital in a country.

The mean present value of human capital may be derived from the following formulation.

$$PV_j = \sum_{i=1}^n \frac{NP_i}{(1+r)^i}$$

j = at the age j years or age of entry into labour market it may vary from 15 to 25 years.

NP = expected average annual earnings.

n = the length of working period, it may vary from 30 to 40 years.

r = discount rate.

i = number of years.

The present value estimates for human capital vary and systematically influenced by various factors. All estimates tend to be imprecise. The market valuation of human capital is influenced by average age life expectancy, health standards and quality of education. Over-estimates and under-estimates may be the outcome of several attempts. The technical details of estimates may not be of public interest. But the estimates of life time earnings from current average annual earnings understate the expected rate of return on education. As the quality of education is improving constantly, the value of human capital is not treated as fixed assets. The life time earnings should be calculated as returns on education. The under-estimated earnings will yield reduced rates of returns on investment in education.

MARKET VALUATION OF HUMAN CAPITAL

The market valuation of human capital depends on some observable characteristics potentially relevant. The independent variables like age, sex, literacy and occupation are very important. The valuation of human capital is positively related to age and skill. People in skilled occupations earn more than other people in ordinary occupations. It is obvious that women receive less income. The decline in the income of women is not surprising because women are preferred for household work. They also work on farms. But the life time earnings of a women are less than men. Women tend to work for shorter periods, and they do not prefer hard work. They enjoy less freedom. Their participation in major part of the decision making is less significant. The periods of absence from duty are longer. Their role as mothers, is under stated, and there is no market valuation for their domestic services. The services of house wife are not valued. There are variations in the net present values of all types of human capital. Human capital valuation has been one of the Central concerns of social and economic studies. Its importance is reflected in the creation of separate ministry of cabinet rank for human resources development in India in 1985. Labour markets in all the countries are imperfect. The market valuation of human capital has great quantitative importance, and significance.

Attempts to delegate planning authority to local authorities have often produced unsatisfactory results.

Resources by themselves are not sufficient without technical assistance to help put resources to productive use.

Human capital valuation continues to perform an important role in human resources development plans. Huge quantitative data may be generated by the operation of the market valuation of human capital. The claims on the services of human beings are traded in the market. The capital values of people are easily established. This will increase our understanding of the economic basis of human capital. The private agencies and Government also buy the services of human beings. In all developing countries the Government is the biggest buyer.

Hence, wages are not determined by market forces. The wages are in fact administered prices, hence the life time emoluments do not present the true values of human beings. But it is also difficult to estimate implicit values. The prospective employee or worker, will sign an agreement or on understanding, to serve the latter for a period specified or otherwise under stated conditions. In return for the commitment of his services, the employee will receive certain fringements, and these may be turned into financial values to be added to life time earnings. The conditions of service are regulated by statutes or acts by the legislature. The terms of service are binding upon both the employer and the employee. The employer's demand is based on the calculation of the discounted value of net future earnings after deducting the expected costs of services. Therefore the present value of the service depends upon the expected value of output or service in each year till the end of the term, and the expected cost of maintenance, supervision, on the job training and other fringe benefits. It is possible to construct net age—wealth profile for all individuals. The flows of income may be used as values of capital stocks. The market for labour produces capital values and flows of income may be inferred. The ownership of human capital produces potential differences. The trends in human capital values may be indicated by mathematical models. The patterns of human capital values may be identified. There is an advantage in hiring young people, because it gives control over their time and effort for longer periods. In the presence of uncertainty (unemployment) the price of human capital is understated. The growing unemployment makes the direction of these prices unpredictable. The productivity of human beings has varied widely. So the market valuation of current flow of income generated by the individual stock of human capital has to vary. The expected price of human capital is not uniform for all individuals. There are random disturbances in the human capital value estimates. The illness of human beings will produce difference between actual price and expected price. The variation in the prices of human capital is not correlated with the characteristics of human labour. Very little evidence of prices of human capital in establishment labour markets survived. The available

evidence will not effect our estimates. The human mortality rates should be taken into account while making human capital estimates. Necessary adjustments may be made to the estimated human capital values. The index of human capital may be related to some observable or observed characteristics relevant to the determination of the present value of human capital stock. The estimated variables include age, sex, literacy and occupation. There are income differentials among regions in the same country or among countries, affected by implicit or explicit factors. There are certain basic relationships underlying the market valuation of human capital. The price of human capital is positively related to age and skill. It is difficult to estimate the value of child bearing for women. Women reach physical maturity earlier than men. So the sex differentials result from the same source. There is a definite relationship between age and productivity. The productivity tends to decline after critical age or 60 years. It is of some interest to consider the implications of the estimated relationship between age and productivity. The relationship between age and productivity is assumed to be linear, but in reality it is not linear. The net earnings profile for skilled workers is steeper than that of unskilled workers. It is concluded that the average productivity of skilled workers rise rapidly during the period of life cycle.

Cost-Benefit Analysis of Expenditures on Education

The Cost-Benefit Analysis is the same as rate-of-return analysis. It is difficult to assess the economic contribution of Education in any country.

EDUCATION AND GROSS NATIONAL PRODUCT

There appears to be strong positive correlation between education and Gross National Product of any country. There are three approaches, simple correlation approach, the returns to education approach, and forecasting man power. The studies have shown that there is a strong positive relationship between enrolment ratios and Gross National Product per capita. Of course it is difficult to make inter-country comparisons. In most countries the educational outlays are correlated to the growth rates of Gross National Product per capita. The correlation between education and Gross National Product should be interpreted as a case for increasing the level of public expenditure on education. The proportion of school population is strongly related to education expenditure as percentage of Gross National Product. A positive correlation may be viewed as evidence in support of the proposition that spending money on education is an important way of raising a country's Gross National Product. But same correlation can also be viewed as evidence in support of the proposition that education is an important consumer good on which countries elect to

spend more as their Gross National Product rises.¹

There are two propositions. The expenditure on education will raise Gross National Product of the country. Another proposition is that the increased Gross National Product will enable the country to enhance educational outlays because education is an important consumer good. So the positive correlation between education and Gross National Product may be interpreted in two ways. Equal educational expenditures in two countries in similar conditions will not yield equal educational output, because of the variation in the degree of efficiency in the use of resources. The public authorities are less efficient in spending money on any project.

Treating education as a consumer good, the income elasticity of demand for education was found to be 3.5 by T.W. Schultz. If income elasticity of demand for any good is greater than one, then it is a luxury item. Hence education may be a luxury. Hence negative substitution effect is swamped by the positive income effect. Education is a long lived asset and an educated man contributes more for the rest of his life. If expenditure on education is doubled in t -years then its positive effect on Gross National Product will be seen for all the years after $t+4$ years. This discussion will help us efficiently manage the resource allocation. The resources may be shifted from low yielding sectors to high yielding sectors. The contribution of education to economic growth may be assessed by generating input series of labour and capital and Gross National Product at constant prices. The investment in education has been rising in all the countries. Investment in education implies investment in future productivity, it is an intangible investment in the quality of human capital.

Benefits of Education

Most studies focussed attention on the contribution of education to earning capacity, or earning power. Earnings of a person are an incomplete measure of productivity. Education raises productivity, most production of education occurs outside the market education benefits many persons other than

1. W.G. Bowen—"Assessing the Economic Contribution of Education" in *Economics of Education* (Ed.) M. Blaug.

students, it benefits student's future, children, neighbours, employers, and society at large. The benefits of education include direct financial returns, financial option meaning the value of the opportunity to obtain still further education, opportunity option involving employment choices, opportunity for hedging, and non-market benefits.

The benefit of education is referred to anything which increases production possibilities, anything which reduces costs, and anything which increases welfare possibilities.

Education is for education, it implies the consumption benefits of education.

Consumption Benefits

The Taste for learning is affected by learning itself. The consumption benefits of education are enjoyed in the present and in the future. There is a large variation in the present enjoyment of education and this might be one of the major causes of vast dropout rate at higher education. Ignorance is not bliss, because it denies the present consumption benefits. There is a difference between expected and realised satisfaction from present and future consumption of education. The tastes of the consumers are not constant. They change and change for better. Education satisfies individual preferences. Education widens the range of choices, and it alters preferences. Parents have stronger preference for higher education than children. Education, like food is a consumption good, but enjoyment of education is different from food consumption. Every man is entitled to education as much as he needs but every one does not want or does not need higher education. The amount of education is a matter of personal choice. People in the higher income groups want higher education as a matter of social status. Some want higher education for its non-monetary consumption benefits, which are always positive. People want higher education, for anticipated future income or consumption benefits.

A large part of education is a consumption component. Education yields the services of durable consumer good. The future satisfaction is greater than present satisfaction. Only

highly educated people enjoy the reading of great works of Shakespeare or Kalidasa, for the average student, higher education may have negative utility. Hence distaste for higher education is causing enormous wastage of youth's man years. As we know that utility of education cannot be measured by any yard-stick. Education makes for richer life. It governs the choice to acquire more education. The parents place greater emphasis on present and future consumption benefits. The decision for more and better education lies with the parents, while the students are allowed to exercise the choice of subjects. The consumption benefits should be added to investment benefits. People in general are motivated for higher learning for its consumption benefits which are larger than investment benefits.

Financial Returns

Education increases the ability of a person to earn more. The present earnings and future earnings are also affected by the level of education. Higher outlays on education are motivated for the achievement of considerable reduction in earnings differentials. They get narrowed as more education is accessible to people. A University graduate earns more than secondary school leaver. The supply of college graduates is steadily increasing. The quality of education is improving all the time. The life time earnings of the educated are greater than that of the uneducated. It is difficult to determine the quality of educational output. Some of the indicators of improvement are : rise in the student enrolment, increase in the number of qualified teachers, improvement in the status, and real earnings steady rise in the expenditure on education, increase in per pupil public investment, rise in the per student capital expenditure etc.

The life time earnings should properly be estimated. The estimates may be made in money of constant purchasing power. The inputs of education include student's time, teacher's time, and public investment in buildings, equipment, and materials. It is difficult to estimate opportunity cost of money invested.

Vaizey's Argument

It would be wrong to include incomes foregone in a calculation of the cost of unemployment because measured national

income does not include the goods and services the unemployed would have produced if they had been working.

Total cost of education includes public expenditure, private expenditure, and incomes foregone by the students during the period of study. The income foregone by the student forms a substantial part of total cost of education, it varies between 50 per cent to 25 per cent. Vaizey has opposed to this method of calculations because the income of the unemployed is zero. The opportunity cost, or income foregone by the students, need not be computed. His argument appears to be realistic in all countries with surplus population. In a situation of growing unemployment, it is futile to compute income foregone by students, because the opportunity cost is zero.

If income forgone is added to the total cost of education then it would seem reasonable to include the cost of services of house-wife, mother, and voluntary work of all sort. It would be necessary to adjust costs by some national estimates of benefits incurred during the period of study, but while estimating the real cost of education, the income foregone by the students should be taken into account, because the service of educated unemployed youth is not free.

The wages are administered prices. The rate of return to education does not represent true picture, because the rate of return only reflects market imperfections which are so serious as to invalidate the results. Expenditure on education is cause and effect of higher incomes. The higher earnings represent monopoly rent, arising out of scarcity of parents willing to send their children for higher education, selective entry into higher education. When the supply of particular skilled labour exceeds the needs, then either quality or prices will suffer a decline. The price of skilled labour varies with the cost of acquiring it. The excess demand for any skill will raise the wages. In most cases the relative earnings reflect family connections, conventions, snob appeal, nepotism, and restrictions on the recruitment of people from other regions, political support, and other market imperfections. Hence the earnings differentials are not fully explained by the levels of education. It is not true that 60 per cent of the variations in earning is explained by the

education. The rate of return studies do not tell us whether education is necessary and sufficient condition of growth. The role of education in the process of growth is not explained.

Denison's Co-efficient

Denison introduced a new concept. Three-fifths of the observed income differentials should be taken as weights. The production function is based on constant-returns-to-scale. Some variation in earnings is attributable to education. A fraction of economic growth is attributable to education. The basic model of Denison represents a linear homogeneous production function.

The earnings differentials attributable to education, should be multiplied by Denison Co-efficient α , varying between 0.6 and 0.66. The value of α varies from country to country. The American α is different from British α . The value of α depends on social class and home background. Better educated people have better educated parents, come from small homes, live in cities, better motivated, achieve high academic grades, gain more self education, live longer and healthier.

Return to Educations

The life time earnings of highly educated people exceed those of people with less education in similar conditions. The extra future earnings outweigh the present costs. It is possible to estimate the internal rate of return. The private rates of return are greater than social rates of returns. Separate rates of returns may be estimated for arts, science graduates. The students are motivated by vocational considerations, in making decisions for higher education. The yields on higher education are greater than secondary education. The seats in the institutes of higher education are rationed, hence all those eligible for higher education are not admitted. Now open university education has open admission system for arts, science and commerce subjects. There has been an enrolment explosion in open university education in Andhra Pradesh since 1984-85. The observable change in the demand for higher education reflects change in taste for higher learning and change in the demand for educated labour in a growing economy. The enrolment ratios vary from

state to state in India. The indirect benefits of education do not determine the individual's choice, but they should be taken into account in the calculation of social rate of return.

Indirect Benefits

The education yields larger indirect benefits. Expenditure on education pays because the indirect benefits of education are the most important, and it is difficult to estimate all the indirect benefits. The indirect benefits can not quantitatively be determined. This difficulty may be viewed as the Achilles heel of this return approach. The indirect benefits are numerous and include the current spill over income gains, the spill over income gains to subsequent generations, cultivating potential talents, facility for skilled manpower mobility, stimulation of research in science and technology, encouragement to lawful behaviour, foster political stability, encourage common cultural heritage and the enhancement of enjoyment of leisure by widening intellectual horizons.

The inter-personal effects and inter-temporal effects of education should not be confused. The simple concept of income spills over is fraught with difficulties. The first round spill overs are always positive. The State is justified in making investment in education. The social rate of returns include direct and indirect benefits of education. It is difficult but not impossible to determine the cash value of indirect benefits. But the second round spill overs are not easy to compute. The children of better educated parents, acquire more and better education. The benefit of educating women is an inter-generation benefit reflected in better education of the children. The indirect benefits of education are more important than direct economic benefits. Hence earnings of educated people should be multiplied by the double the alpha value, *i.e.*, 1.2 instead of 0.6. The additional spending on research will produce more valuable scientific results. The lower skills are in plenty of supply, but higher skills are scarce, so a skill pyramid is the outcome of expanding education.

Quasi-Public Good

The intangible benefits of education are many. Education satisfies a social want, hence it is a social good. It is not pure

public good like light house, national defence, national highway. Education is a Quasi-Public Good like medical care, because the economic benefits are largely personal and divisible, it is rationed. Hence the economic benefits may be compared. The inputs of educational system are bought in the market. The output of educational system, *i.e.*, the services of an educated person, is sold in the market. Hence the cost benefit analysis is of common interest, public concern and it has relevance.

Objections to Returns Approach

Many objections have been advanced against the rate of return approach. There is no direct cause and effect relation between education and earnings. The variables like education, earnings, ability, motivation, social class, and others are inter-related, or inter-correlated. There is a multiple correlation between wealth, income, access to education, motivation, access to job opportunity, and success in life. The education is maldistributed, and incomes are unequal. There may not be any cause and effect relationship between education and income. The amount of education is a matter of personal choice, and choice is influenced by numerous unidentified variables. In this case the co-efficient of ignorance is large. It is difficult to isolate the pure effect of education on earnings. The multiple regression analysis allows separation in influence of particular variable on earnings. Some studies have been able to show the particular influence on earnings. The earnings are affected by income, age, formal education, caste or social class, native place, intelligence, initiative, parents' education, family size, parents occupation, religion, region, city, dwelling occupational choice, level of unemployment, mobility and hours of work. There is a tendency to understate the pure effect of education on earnings. In most cases education emerges as the most powerful determinant of family income. Nearly 40 per cent of the earnings differentials are explained by education and age. The college education is one of the major determinants of excess life time earnings. Denison found that 66 per cent of the earnings differentials between high school and college graduates is due to the education, which is a generator of higher future earnings.

It is assumed that people are motivated not by financial considerations. The calculation of returns depends on future trends from cross-sectional evidence. The earnings differentials reflect long established social connections, and imperfect labour market. The rate of returns approach does not assess the contribution of education to economic growth. It is difficult to quantify the indirect benefits and income spill overs. The social rates of return do not guide the authorities to maximise national product.

Implications

A small part of the total cost falls on the students. Hence the social rate of return is smaller than private rate of return. According to social time preference, it may not be a wise policy to expand investment in education. The social opportunity cost of education, meaning alternative use of resources invested in education is the most important guiding principle. The direct benefits of education alone can not justify the increase in public investment in education. The social returns is the sum of all individual benefits. The public subsidies to colleges and schools, reduce the burden on the students and parents. The social rate of return to higher education was estimated at 8 per cent. The maintenance grants sanctioned to students, during the college study, reduce the opportunity cost, *i.e.*, income foregone by the students, with the results the university education is heavily subsidised. The private rates of return are greater than social rates of return, hence there is a case for changing more to the beneficiaries from higher education. But this would conflict with the social object of equity. The secondary education will enable the students to obtain higher education, it may imply negative option value.

There is also a case for making education self-sufficient, it means that education should pay for itself, hence free education should be abolished. The rate of return approach has a sense and non-sense. It ignores broader cultural and political benefits of education. The private rates of return can throw indirect light on the cause of early leaving, the subject wise cost-benefit analysis shows that the cost of science students is twice that of arts students.

According to the benefit principle, the beneficiaries of higher education should be charged and the cost should be recovered. But the private rate of return is twice the social rate of return. The benefit principle is not applied to education, and there is a strong support to government guaranteed loans to the students. The students loans are expected to encourage them to reach the levels of university education. The students loans have been introduced in Indian Universities because such schemes were introduced in the Netherland, West Germany, and Sweden, and they have been successful. Most loans are not recovered. The rate of return approach cannot tell us whether education should be privately or publically produced, provided and financed. But some education should be allowed to be privately provided and financed. It is difficult to determine the exact size of privately produced education. It may meet the economic ends of education, while publically provided education will meet the demands of social justice. The rate of return approach can indicate the desirable direction of change in educational policy. There cannot be complete substitution of skills. Hence, the elasticity of substitution between skills is less than unity. The rate of return analysis is a useful exercise. It yields conclusion that parents or the students are not sufficiently competent to choose special skills. The elasticity of demand for particular skill is less than one. The production of highly educated manpower is the only economic purpose of education. The rate of return approach might prove detrimental to the growth of higher education. The society may want government's policy determined by an investor's point of view.

Primary Education in Andhra Pradesh

At the time of formation of the Andhra Pradesh on 1st November 1956 there were 20,540 primary schools in Andhra area, while in Telangana area 7,038 primary schools (the number of primary schools in Andhra area were nearly 3 times that of Telangana region). At the end of year 1956 primary schools numbered 28,083.

The teacher-pupil ratio in elementary schools has been raised to 1:25, it implies one teacher for every 25 pupils. The Government gradually took over the aided primary schools in the State.

Progress of Primary Education

The Progress of primary education is reflected in enrolment figures. In 1956-57 the boys enrolled in primary sections of upper primary schools, high schools and higher secondary schools and primary schools numbered 15,44,039 as against 9,10,015 girls. In 1979-80, total enrolment of boys and girls was 50,90,781. The enormous increase in the enrolment figures show that people are willing to send their children to schools. The increased awareness of the people has boosted up the enrolment figures. The data presented in Table 4.2 reports upward trend in the enrolment of students in the primary education. The official enrolment figures are generally believed to be over-stated for two reasons. First there is no neutral

source of information. Second there is a reason to believe that inflated enrolment figures are supplied by school managements as public support is linked to enrolment.

Table 4.2(A) shows the relationship between population growth and student's enrolment in primary education. It is apparent from the Table 4.2(A) that increases in population are followed by increase in the enrolment of girls and boys in primary education. It is encouraging to note that the aggregate enrolment in primary education was doubled during the period, *i.e.*, 1956-57 to 1978-79, while the population increased by 51 per cent during the same period.

The enrolment index, defined as number of children enrolled per 10,000 population in primary education, shows upward trend as shown in Table 4.2(A). The enrolment index increased from 724 in 1956-57 to 933 in 1963-64. After 1963-64, the enrolment index shows mild fluctuations. In 1978-79, it reached peak, *i.e.*, 962. The average enrolment index was 883.8 during the entire period of 23 years. The standard deviation in the enrolment index was the lowest while in 1978-79, it touched the peak.

Primary Education—Enrolment and Internal Efficiency

Enrolment in Primary Schools

The progress of primary education is measured by the enrolment effort. There has been upward trend in the enrolment of the children in primary schools. Total enrolment in 1956-57 was 23,69,309. The girls enrolled numbered 869754 in the same year 1956-57 in Andhra Pradesh which formed 36.7 per cent of the total enrolment. Table 4.1 indicates upward trend in the enrolment of boys and girls during the period 1956-57 to 1979-80. This provides persistent existence of collective willingness to invest in education. The results summarised are given in tabular form on succeeding page.

It is encouraging to note that girls ratio in the total enrolment has increased from 36.7 per cent in 1956-57 to 41.5 per cent in 1979-80. The enrollment of girls rose by 82.6 per cent during 1956-57 to 1979-80 as against 61.6 per cent over all increase in the aggregate enrolment effort.

<i>Year</i>	<i>Boys enrolled</i>	<i>Girls enrolled</i>	<i>Total enrolment</i>
1956-57	1499555 (63.3)	869754 (36.7)	2369309 (100.00)
1979-80	2242261 (58.5)	1588357 (41.5)	3830618 (100.00)
Percentage increase over 1956-57	49.5	82.6	61.6

Enrolment in Primary Sections—Upper Primary Schools, High Schools and Primary Schools

In Andhra Pradesh the Primary sections are not separated from upper primary schools (classes from I to VII) and some high schools (classes from I to X). Hence, the enrolment in primary schools as indicated in Table 4.1 tells only part of the story. To enrolment in primary sections is shown in Table 4.2. It indicates upward trend in aggregate enrolment effort in primary education in the State. The distribution of enrolment is not even. Female enrolment is less than male enrolment. The summary results of the Table 4.2 are shown below :

<i>Year</i>	<i>Enrolment of boys</i>	<i>Enrolment of girls</i>	<i>Total enrolment</i>
1956-57	1544039 (62.9)	910015 (37.1)	2454054 (100.00)
1979-80	2992614 (58.8)	2098167 (41.2)	5090781 (100.0)
Percentage increase over 1956-57	94	130	107

The aggregate enrolment rose by 107 per cent during the period 1956-57 to 1979-80. The enrolment of girls rose by 130 per cent as against 94 per cent increase in the enrolment of boys during the same period. The girls ratio also increased from 37.1 per cent in 1956-57 to 41.2 per cent in 1979-80. This is an encouraging trend.

Primary Schools

As the demand for primary education increased, the number of primary schools rose. Table 4.3 indicates an increasing trend in primary schools opened in the State.

The data shown in Table 4.3 are summarised below :

<i>Year</i>	<i>Number of Primary Schools</i>
1956-57	29,076
1978-79	39,696
Percentage increase	36.5

The number of primary schools in Andhra Pradesh rose by 36.5 per cent during the entire period of 1956-57 to 1978-79. This increase is not significantly high, over a period of more than two decades.

Table 4.3 presents primary schools by management. The primary schools are classified according to management into six groups, *i.e.*, central government primary schools, schools under state government, primary schools under the management of samithis, municipal schools, private aided school and private unaided schools. The central government schools do not form any significant proportion. The number of central schools fluctuated between 20 to 36 during the period under study. The primary schools under the state government rose from 7,501 in 1956-57 to 1,084 in 1978-79, while the primary schools under the management of Panchayathi samithis rose from 10,512 to 35,195. The samithi schools formed very significant proportion in primary education. There has been upward trend in municipal schools (494 schools under municipalities in 1956-57, 1156 municipal schools in 1978-79). It is disheartening to note that the private aided primary schools have dwindled from 10,400 in 1956-57 to 2,063 in 1978-79. The data presented in Table 4.3 are summarised hereafter.

<i>Year</i>	<i>Govt. Schools</i>	<i>Samithi Schools</i>	<i>Municipal Schools</i>	<i>Private Schools</i>	<i>Others</i>	<i>Total</i>
1956-57	7501 (25.8)	10512 (36.2)	494 (1.7)	10400 (35.8)	169 —	29076 (100.0)
1978-79	1084 (2.7)	35118 (88.5)	1156 (2.9)	2063 (5.2)	275 —	39696 (100.0)

Percentage
increase or
decrease over

1956-57	592	234	134	404	—	36.5
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Note : (—) Indicates negligible.

The statement above indicates that the schools under the management of state government declined. They formed more than one fourth of total schools in 1956-57 but decreased to 2.7 per cent of the total schools. The Samithi Schools formed 36.2 per cent in 1956-57 and this ratio increased to 88.5 per cent in 1978-79. As a consequence of decentralisation of administration and establishment of Panchayathi Raj institutions in the State, the Primary education has been entrusted to the management of Samithis. Hence there has been enormous increase in the number of schools under the management of Samithis.

Municipal schools have registered an increase of 134 per cent during 1956-57 to 1978-79 there has been a significant decline in the number of schools under private management, the private aided schools decreased from 10400 in 1956-57 to 2063 in 1978-79, a decrease of 404 per cent. The private aided schools formed 35.8 per cent, a considerable major sector, but its share declined to only 5.2 per cent in 1978-79. This indicates that educational institutions do not evolve in the absence of governmental support. This requires a thorough study and private sector has to be achieved. The private initiative has to be encouraged if the speed of expansion of Primary education has to be increased to achieve the much published goal of universal primary education, because one has to be concerned not only with the amount of resources consumed in the educational process but also with the results obtained by it.

The sharp decline in the number of primary schools in the private sector might be the result of upgrading the existing Primary schools into upper Primary schools or high schools, and starting high schools straight away.

Enrolment Effort

The enrolment effort is reflected in the enrolment figures. Table 4.5 indicates upward trend in the percentage of boys enrolled in primary education in the State. In 1956-57 the boys enrolled numbered 15,44,039 out of population 21,33,200 forming 72.38 per cent. By 1961-62, the percentage of boys enrolled increased to 91.10. The pace of the enrolment appeared to have been slackened after 1965-66. In 1976-77 the percentage of boys enrolled slumped to 74.14 and in subsequent years it has shown smart recovery. The data presented in Table 4.5 are summarised below :

<i>Year</i>	<i>The enrolment of boys</i>	<i>Population of boys in the age group of 6-11</i>	<i>Percentage</i>
1956-57	1544039	2133200	72.38
1966-67	2305969	2560765	90.05
Percentage increase over			
1956-57	49.35	20.04	—
1979-80	2992614	3413324	85.00
Percentage increase over 1956-57	93.82	60.00	—

The statement above gives a bird's eye view of the progress in the enrolment of boys in primary education in the State. The percentage of boys enrolled increased from 72.38 in 1956-57 to 90.05 in 1966-67, but declined to 85.00 in 1979-80. The fluctuations in the enrolment ratio shows gaps in the efficiency level of the school education. The population figures in Table 4.5 have been computed from the year 1965-66 as the enrolment ratios were given, for the years in subsequent

period. The boys enrolled in Primary education increased by 93.82 per cent during the period of 1956-57 to 1979-80, as against 60 per cent increase in population during the same period. It implies that the rate of enrolment was greater than the population growth rate (the boys in the age group of 6 to 11 years). This is a welcome trend.

The education of girls has been receiving increasing public attention. It appears that today more girls attend primary schools than in 1956-57. Table 4.6 shows upward trend in the enrolment of girls in primary education in the State. The following statement gives the progress in the enrolment of girls in primary education.

<i>Year</i>	<i>No. of girls enrolled</i>	<i>Population of the girls in the age group (6-11 years)</i>	<i>Percentage</i>
1956-57	910015	2102600	43.28
1966-67	1553425	2552875	60.85
Percentage increase over			
1956-57	70.70	21.42	—
1978-79	2024159	3551156	57.00
Percentage increase over 1956-57	122.43	68.90	—

The percentage of enrolment of girls increased from 43.28 in 1956-57 to 60.85 in 1966-67, and it has declined to 57.00 in 1978-79. The girls enrolled in primary education increased by 122.43 per cent during the period of 1956-57 to 1978-79 as against 68.90 per cent increase in the number of girls in the age group of 6 to 11 years. The enrolment growth rate of girls in primary education was greater than the population growth during the same period. It is natural that people tend to make a comparison of two statements.

<i>Year</i>	<i>Percentage of boys enrolled</i>	<i>Percentage of girls enrolled</i>	<i>Difference</i>
1956-57	72.38	43.28	29.10
1966-67	90.05	60.85	29.20
1978-79	85.00	57.00	28.00

It is evident from the statement that the boys enrolment was more than 28 per cent than girls' enrolment. In 1978-79 less than sixty per cent of girls attended primary schools as against less than 45 per cent of girls in 1956-57, the increase in enrolment ratio of girls was 14 per cent as against 13 per cent increase in the enrolment ratio of boys during the period 1956-57 to 1978-79.

Table 4.7 displays upward trend in the total enrolment effort in Primary education. The percentage of boys and girls who attended the primary schools was 57.94 per cent in 1956-57. By 1962-63, more than 76 per cent of girls and boys attended Primary schools. The increase in enrolment of the children in Primary schools might reflect the planned government efforts in the expansion of Primary education, intended to make the country literate. In 1964-65, the government effort appears to have been slackened because of huge cut in education budget, resultant of Chinese Aggression in 1962. After 1966-67, the enrolment effort appears to be on declining trend. By 1975-76, the percentage has reached to 63.41, the lowest ever touched, during the period of 1966-67 to 1975-76. In 1977-78, the enrolment has shown a big spurt, it jumped to 72.5 per cent. By 1979-80, it reached 81 per cent, the peak in the enrolment effort, during the entire period of 1956-57 to 1979-80. The fluctuations in the enrolment effort might reflect the changing school efficiency and public co-operation. The average enrolment during the entire period 1956-57 to 1979-80 was 69.49 per cent. The standard deviation in the enrolment during period under study was 6.23. In spite of mild fluctuations in the enrolment, the trend in the aggregate enrolment appears to be encouraging.

Cycles in the Enrolment of Boys and Girls and NDP at 1960-61 Prices

An attempt is made to identify the relationship between the rates of enrolment of children in I class and NDP at 1960-61 prices. The changes in the NDP at 1960-61 prices, reflecting the aggregate economic activities in the country are followed by the changes in the enrolment growth rates of children in I class. During the periods of depression, it appears, less number of children enrolled in I class. For example in the year 1962-63, NDP at 1960-61 prices showed negative growth rate, and the enrolment growth rate was also negative for boys, *i.e.*, 2.36 per cent as revealed in Table 4.8. In subsequent years the NDP at 1960-61 prices started smart recovery but the enrolment of boys and girls in I class continued to be negative for two years. The enrolment growth rates in I class reached peak level in 1961-62, *i.e.*, 18.34 per cent for boys, 34.60 per cent for girls and NDP recorded 7 per cent growth rate in the same year. Table 4.8 shows strong relationship between the growth rates of enrolment of boys and girls. The results of Table 4.8 are given below :

<i>Year</i>	<i>Growth rate of enrolment of boys</i>	<i>Growth rate of enrolment of girls</i>
1963-64	—1.82%	—3.32%
1964-65	—3.83%	—7.12%
1968-69	—0.79%	—0.63%
1969-70	—4.04%	—4.28%
1973-74	—1.34%	—0.56%

It appears from the Table 4.8 that the cycle of enrolment of boys and girls is spread over five years.

In 1961-62, the enrolment growth rate was the highest for boys and girls, considering the age of the child (5 years) at the time of enrolment, it may be concluded that the year 1956-57 may be regarded as baby boom year in Andhra Pradesh (it is not unrealistic to assume that more children born in 1956-57, more children will be enrolled in 1961-62). In 1977-78 the growth rate in NDP at 1960-61 prices was 11.57 per cent while

the growth rates in enrolment of boys and girls were 9.74 per cent, and 13.34 per cent respectively. It follows that 1972-73 may be considered a year of baby boom. During the period of 1960-61, 1961-62, the growth rates of enrolment of girls exceeded the growth rates of boys enrolment. It is also seen the same trend during the period 1974-75 to 1978-79. Hence it appears that the gaps in the growth rates of enrolment of boys and girls are being filled. Assuming this trend to continue, it may be said that the principle of equity in sexes is being met at slow pace. The average growth rate in the enrolment of girls during the period 1956-57 to 1978-79 was 3.62 per cent equivalent to the average growth rate in NDP at 1960-61 prices, while the enrolment average growth rate showed 2.89 per cent only. The variation in the enrolment of girls in I class was wider than boys enrolment (the standard deviation in the growth rates of girls in I class was 8.33 while that of boys was 5.12). The co-variance between the growth rates in the enrolment of boys and girls was 40.09. The growth rates in the enrolment of girls are strongly correlated to the growth rates of boys enrolment in I class, the coefficient of correlation was +0.949.

Class-wise Enrolment

The Tables 4.9 and 4.10 reveal class-wise enrolment of boys and girls. The tables show upward trend in the enrolment of boys and girls. The data presented in Table 4.9 in respect of boys are summarised below :

Year	I	II	III	IV	V
1956-57	588408	327835	254556	199313	173927
1978-79	1072719	623555	490694	388072	326285
Percentage increase	82	90	92	94	88

It is apparent from the statement that the enrolment of boys increased in each class during the period under study. The enrolment of boys recorded an increase of 82 per cent, in I class, 90 per cent II class, 92 per cent in III Class, 94 per cent in IV Class, 88 per cent V Class during the period of 1956-57 to 1978-79. It has shown increasing trend from I Class to

IV Class, but slipped down in V Class during the period under consideration.

Table 4.10 presents class-wise enrolment of girls during the period of study. The data contained in Table 4.10 are summarised below :

<i>Year</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>V Class</i>
1956-57	389589	198272	143120	101337	77697
1978-79	799098	442220	329690	250815	202336
Percentage increase	105	123	130	147	160

The enrolment of girls showed 105 per cent increase in I Class, 125 per cent increase in II Class, 130 per cent increase in III Class, 147 per cent increase in IV Class, 160 per cent increase in V Class. It has shown upward trend throughout from I Class to V Class during the period under consideration.

The increase in enrolment of boys and girls is shown below :

<i>Year</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>V Class</i>
The Percentage increase in the enrolment of boys 1956-57 to 1978-79	82	90	92	94	88
The Percentage increase in the enrolment of girls 1956-57 to 1978-79	105	123	130	147	160

It is heartening to note that the enrolment of girls has been increasing faster than the boys enrolment during the period 1956-57 to 1978-79, as shown in the above statement. The percentage increase in the enrolment of girls was 105 as against 82 per cent increase in the enrolment of boys in I Class during the period under consideration. And also, the percentage

increase in II Class in respect of girls was almost double that of boys during the same period. The persistent increase in the enrolment of girls may tend to fill the educational gap between men and women.

School Efficiency

One has to be concerned not only with the amount of resources consumed in the educational process but also with the results obtained by it.

In a given situation as the range and depth of the knowledge provided increase, it may be argued the number of individuals able to absorb it diminishes and conversely which is greater, a small number of people with a greater sum of knowledge or a greater number of people with a lesser sum of knowledge? In other words should we measure the service by the knowledge distributed or through the number of persons who acquire a given portion or percentage of the possible knowledge?

Each system of education lays down a syllabus to decide on the range of knowledge that it sets out to provide. This is a datum in the educational process. The variable is the number of pupils acquiring such knowledge. The final products of the educational process can be defined as those pupils who have proved according to a given criterion, that they have absorbed a given range of previously established knowledge.

The internal efficiency of elementary education can be studied by the progress of children from grade to grade and number of years it takes to produce a specified number of elementary school graduates.¹

The internal efficiency of elementary education in Andhra Pradesh as reflected in Tables 4.9 and 4.10, is not encouraging. In 1956-57, the number of boys attending school in I Class was 5,88,408 while the boys receiving elementary education in V Class in 1960-61, numbered 1,90,691 only. It works out 32

1. See K. Venkata Subramanian, *Wastage in Primary Education*, (The Problem in General and with special reference to Tamilnadu, India), published by Orient Longmans Ltd., 1978, pp. 1 and 2.

per cent. It means during the period *i.e.*, 1956-57 to 1960-61, the internal efficiency of elementary education is only 32 per cent in respect of boys. It means that out of 100 boys enrolled in 1956-57 in I Class only 32 boys got through IV Class to be admitted in V Class in 1960-61 assuming no additional enrollment in Classes II, III and IV.

In 1956-57, the girls enrolled in I Class were 3,89,589 and in 1960-61, the girls attending elementary schools in V Class numbered 94,959, *i.e.*, 24 per cent. It implies that the school retention rate in respect of boys was greater than girls in the State during the period under study. It appears that the studies in other States support this quantitative evidence.

The internal efficiency or retention rate in elementary education is explained in Table 4.11 in respect of boys and in Table 4.12 in respect of girls.

The data presented in Table 3.11 in respect of boys are summarised below :

<i>Period</i>	<i>Efficiency rate</i>
1956—57 to 1960—61	32 per cent
1974—75 to 1978—79	39 per cent.

Table 4.11 reveals increasing trend in the efficiency rate in respect of boys. The data presented in Table 4.12 in respect of girls are briefed below :

<i>Period</i>	<i>Efficiency rate</i>
1956-57 to 1960-61	24 per cent
1974-75 to 1978-79	35 per cent

The statements above exhibit a distasteful fact that the school internal efficiency in respect of boys and girls is not found to be encouraging though it keeps upward trend. In aggregate the retention rate in respect of boys was significantly greater than the girls in elementary schools in the State. The retention rate in Andhra Pradesh, like any other Indian state is very low when compared to some of the Asian countries. The retention rates in school education are noted as follows :

Japan 90 per cent, Malaysia 81 per cent, Afghanistan 74 per cent, Philippines 69 per cent, Ceylon 64 per cent, Pakistan 26 per cent, Burma 19 per cent and Thailand 53 per cent.²

Input-Output Ratio

The number of children admitted into Primary schools are to be taken as Inputs and those who complete the required school years and acquire necessary functional skills, may be taken as Outputs of the school system.

Input-output ratio is another way of looking at the school performance. An attempt is made in this study to compute input-output ratios for boys and girls separately over the period under consideration. Table 4.13 presents input-output ratios in respect of boys. The input-ratio is very high in I class, as revealed in Table 4.13. Input-output ratios in respect of girls are shown in Table 4.14. It also indicates high input-output ratio in I class. The data presented in Tables 4.13 and 4.14 are summarised below. The mean values are shown here under.

<i>Period</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Mean</i>
1956-57 to 1978-79					
Boys	1.7	1.3	1.2	1.2	1.3
Girls	1.7	1.3	1.3	1.3	1.4

The statement shows that in aggregate the input-output ratio of girls is greater than that of boys during the period of study. The study confirms the prevailing trend input-output ratios in Asian countries. The input-output ratios in respect of some of the countries are noted below.³

<i>Countries</i>	<i>Median input-output ratio</i>
(1) African countries	2.00
(2) Latin American countries	1.90
(3) Asian countries	1.31
(4) European countries	1.20

2. See K. Venkata Subramanian, *Wastage in Primary Education*, published by Orient Longmans, p. 7.

3. See K. Venkata Subramaniam, *Wastage in Primary Education*, published by Orient Longmans, p. 6.

The output from elementary schools is predominantly influenced by the factors like literacy rates and per capita income. It is also seen in general that literate parents send their children to schools. Table 4.15 presents data on output of primary schools, in different States, literacy rates and per capita income. It is apparent that there is a strong correlation between the output of primary schools and rates of literacy, the co-efficient of correlation was found to be +0.79 indicating significant relationship. There appears to be a weak correlation between output of primary schools and per capita income, as the correlation co-efficient was +0.35.

The Enrolment of Children of Scheduled Caste

Social justice is expected to be achieved through the expansion of educational opportunities and primary education may be considered one of the instruments of achieving social justice.

Tables 4.17 and 4.18 present class-wise enrolment of boys and girls of scheduled caste respectively. The total enrolment shows upward trend. In 1964-65 the boys enrolled in primary schools numbered 3,09,169 against 1,90,984 girls. In 1978-79, the enrolment of boys in primary education stood at 5,26,432 while the enrolment of girls was only 3,59,264 during the same year. The data presented in Table 4.17 are summarised below :

<i>Year</i>	<i>Total enrolment of boys</i>	<i>Percentage of the total enrolment</i>
1964-65	309169	14.1
1978-79	526432	18.1

Total enrolment of boys increased by 70 per cent during the period under study. In aggregate the boys of scheduled caste enrolled in primary education in as a percentage of total enrolment was only 14 (the percentage of reservation in higher education and jobs is 14, in respect of scheduled castes).

The data presented in Table 4.18 in respect of girls of scheduled caste shows upward trend in the enrolment. The following summary gives a brief account.

<i>Years</i>	<i>Total enrolment of girls</i>	<i>Percentage of the total enrolment of girls</i>
1964-65	190984	13.1
1978-79	359264	17.7

The enrolment of girls in primary schools increased by 88 per cent as against 70 per cent of boys during the period 1964-65 to 1978-79. On the whole the girls from scheduled caste formed only 13.3 per cent of the total enrolment of all girls in primary education during the period under review. It is apparent from the Table that fewer girls from scheduled caste attend primary schools than boys despite increased incentives for learning.

The Enrolment of Children from Scheduled Tribes

The enrolment of boys from scheduled tribes shows upward trend as shown in Table 4.19. The data presented in Table 4.19 are summarised below :

<i>Years</i>	<i>Total enrolment of boys in primary education</i>	<i>Percentage of the total enrolment</i>
1964-65	51853	2.4
1978-79	148563	5.1

It is encouraging to note that the boys enrolled as a percentage of total enrolment increased during the period. The mean percentage of boys of STs to the total enrolment was only 3.1 during the period under review (it is not out of place to note that the percentage of reservations in higher education and jobs in respect of scheduled tribes is only 3).

The enrolment of boys of STs increased by 186 per cent as against 70 per cent of SCs. This happened because of rapid expansion of primary schools in Tribal regions and increased monetary incentives for learning.

The Tables 4.20 presents upward trend in the enrolment of girls. The data are summarised hereafter.

<i>Years</i>	<i>Total enrolment of girls of STs</i>	<i>Percentage of total enrolment of girls</i>
1964-65	26677	1.8
1978-79	80004	3.9

The enrolment of girls of STs increased by 199 per cent as against 186 per cent in respect of boys. On the whole girls of STs enrolled formed only 2.4 per cent of all the girls, in spite of increased enrollment of girls of STs in primary education, the mean percentage was 2.4 less than boys whose mean percentage was 3.1. Despite increased opportunities, the tribals exhibit weak preference for girls education, once the tribals are enlightened through popular education, it is not unreasonable to assume that they tend to prefer girls education. Knowledge once acquired, becomes instrumental for social change.

District-Wise Enrolment

An attempt is made to identify the districts with high percentage of enrolment. The data are collected for the year 1979. Table 4.20(A) presents data pertaining to district-wise enrolment.

Srikakulam, has the highest percentage of primary schools in the State. It has also high percentage of enrolment of boys and girls.

Some districts like East Godavari, West Godavari and Guntur have high percentage of enrolment. East Godavari district has the highest percentage of enrolment of girls.

In contrast to the districts of Andhra region, comprising the districts of Srikakulam, Vishakhapatnam, East Godavari, West Godavari, Krishna, Guntur and Prakasham, the districts of Telangana region, *i.e.*, Hyderabad, Nizamabad, Medak, Mahabubnagar, Nalgonda, Warangal, Khammam, Karimnagar and Adilabad display very low enrolment of girls. The percentage of primary schools in the districts of Telangana region did not exceed.

The regional disparities in the educational opportunities should be narrowed down as far as possible. In certain districts, like Guntur, West Godavari and East Godavari, the primary schools appear to be over crowded. For example, Guntur district has 6 per cent of primary schools whereas the enrolment of boys is 8 per cent, and the enrolment of girls is 9 per cent. One is likely to draw the some conclusion in respect of East Godavari and West Godavari districts. Medak, has the lowest percentage of primary schools *i.e.*, 2 per cent. It has 2 per cent of boys enrolled, 1 per cent of girls enrolled.

Representation Index

Another way of looking at the schools efficiency is the Representation Index, defined as the proportion of the national primary enrolment in the State divided by the proportion of the relevant age group. The RI is an indicator of over-representation (when the value of RI is greater than one) or under-representation (when the value of RI is less than one) of any region or district in the State. When the value of RI is unity, it indicates representation exactly in proportion to the State's population.

The RI indicates whether a given group or region is under-represented or over-represented. The scarce resources, are usually maldistributed, hence, some regions or groups are over developed. There is no universal tendency for the growth to spread. So, the social scientists invented a concept of mathematical measurement to identify maldistribution. The RI is also a measurement of degree of maldistribution.

The RI is computed as follows :

$$RI = \frac{e_t \div E}{P_t \div P}$$

where

E = Total National enrolment

e = enrolment in the region.

P = Total population in the relevant age-group in the State

P_t = Population in the relevant age group in the region or district.

or it can be computed as follows :-

$$RI_t = \frac{e_t \div P_t}{E \div P}$$

in short

$$RI_t = \frac{\text{Enrolment rate in the region}}{\text{Enrolment rate in the State}}$$

The RI is used on enrolment distribution where the data are made available. (RI is generally used with respect to the distribution of any scarce resources or benefits).

The RI is used to identify whether any State is under-represented in India with respect to the distribution of human capital, *i.e.*, the literate population.

$$IR_t = \frac{\text{State's literacy rate}}{\text{All India literacy rate}}$$

The RI, computed with respect to literacy in Andhra Pradesh is given below :

<i>Year</i>	<i>Representation Index</i>
1951	0.79
1961	0.88
1971	0.84
1981	0.85

The value of RI is less than unity in all these years. Hence it is concluded that Andhra Pradesh has been under-represented during all these years with respect to the distribution of human capital.

The distribution of inputs in education such as teachers can also be analysed. An RI is a measure of comparative disadvantage for group or area at a given time.

The relative disadvantage of poorer areas with respect to the distribution of scarce resources or benefits can be monitored by calculating the base line RIs. A rise in RI indicates an

improvement in its position relative to the national average irrespective of a change in the latter.²

Gini Co-efficient

The Gini co-efficient is a single statistic summarizing relative inequality cross all groups or areas at once. It is mostly used by the economists to measure inequality between income groups, it is also useful in portraying unequal distribution of scarce resources across a population.

The simple way to understand the Gini co-efficient is to plot the percentage shares of two variables, *i.e.*, enrollment and population, on the graph, the resultant graph would be "Lorenz" curve of concentration. The Gini co-efficient is computed as follows :

$$\text{Gini Co-efficient} = \frac{A}{A+B}$$

where A indicates the area with in the Lorenz Curve and the diagonal.

where B indicates total area within the triangle formed by Lorenz Curve.

The Gini co-efficient may also be computed by following certain procedure. The mathematical measure of Gini co-efficient ranges from zero to one. In real world the Gini co-efficient is never zero or one. The zero Gini co-efficient indicates absolute equality, while one implies absolute monopoly of one person over the scarce resources. The Gini co-efficient was 0.1054 with respect to primary enrolment in Indian states in 1977.³

Teachers

The number of teachers at primary level of education per 10,000 population, is to be taken as Teacher Index, a measure of an important part of the stock of strategic high level man-

2. Stephen P. Heyneman, World Bank Staff Working Paper No. 327. *Investment in Indian Education Uneconomic*, p. 53-54.

3. Stephen P. Heyneman, World Bank Staff Working Paper No. 327, *Investment in Indian Education, Uneconomic ?* World Bank Publication 1979, p. 33.

power. The progress of primary education, an indicator of popular enlightenment depends on teachers.

Education is considered labour-intensive industry. Teacher is an important labour input in this sector. The range and depth of knowledge provided, the quantity and quality of the outputs of this industry *i.e.*, students, elementary school graduates, depend on teacher.

Table 4.4 presents the number of teachers in primary schools. In 1956-57 the number of teachers in primary schools was 77,205. The size of teachers in primary schools was reduced to 74,232 in 1957-58. The decline in the number of teachers was attributed to upgrading primary schools into upper primary schools or high school. In secondary school, the primary sections were not separated, and teachers working in secondary schools, were required to teach the pupils in primary sections as well as students of secondary school. Hence, it becomes difficult to account primary school teachers. So the strength of primary school teachers is difficult to estimate. In 1963-64, the size of teachers in primary school reached 86781, the maximum during the period of 1956-57 to 1978-79. Table 4.21 displays fluctuations in the number of teachers in primary school in the State. It is disheartening to know that teacher-pupil ratio has shown upward trend. In 1956-57 the teacher-pupil ratio was 31 and it rose to 47 in 1978-79. This indicates overcrowding in primary school. The data presented in Table 4.21 are summarised below :

<i>Year</i>	<i>The total enrolment in primary schools only</i>	<i>Number of teachers employed</i>	<i>Teacher- pupil ratio</i>
1956-57	2369309	77205	31
1977-78	3719292	78802	37
Mean during the entire period	3067541	79022	39
Standard Deviation	301408	2408	33

The statement above shows that the increase in the enrolment figures are not exactly followed by the increases in the number of teachers. The student enrolment has increased steadily over the period while the size of teachers suffered fluctuations, the co-efficient of variation was over 3 per cent.

The primary school teacher index as displayed in Table 4.22 shows upward trend. The primary school teacher index defined as number of teachers per ten thousand population was 19 in 1956-57. It rose to 25 in 1978-79. The data displayed in Table 4.22 are summarised below :

<i>Years</i>	<i>Primary school teachers in 000s</i>	<i>Population in 000s</i>	<i>Primary school teacher index</i>
1956-57	62.924	33874	19
1978-79	126.294	51196	25

In spite of fluctuations in the size of teachers in primary schools, the primary school teacher index increased during the period under study.

Quality of Teachers

A trained teacher is assumed to be a better fit to the job than an untrained teacher. The number of trained teachers, as shown in Table 4.23, increased during the period of 1956-57 to 1978-79. The data presented in Table 4.23 are summarised below :

<i>Year</i>	<i>Total teachers</i>	<i>Trained teachers</i>	<i>Percentage of the trained teachers</i>
1956-57	77205	61945	80
1978-79	78802	77673	99

The percentage of trained teachers increased from 80 in 1956-57 to 99 in 1978-79. The rise in the number of trained teachers indicates an improvement in the quality of teachers.

Women's Participation in Education

Education is better suited to women than any other sector, though women's entry into other fields including defence and

management has been widely acclaimed. In 1956-57, the percentage of women primary school teachers, as displayed in Table 4.24 was only 18. It rose to 27 in 1978-79. The percentage of trained women teachers in the state also increased during the period. The data presented in Table 4.24, are shown here in brief :

<i>Years</i>	<i>Total number of teachers</i>	<i>Women teachers</i>	<i>Percentage of women teachers</i>
1956-57	77205	13759	18
1978-79	78802	21401	27
Percentage of increase	2.1	55.5	9

The percentage increase of women teachers was greater than percentage increase in the total number of teachers. The statement above shows increased participation of women in primary education. But still the percentage of women teachers in primary schools was less than 30 per cent.

The employment of women teachers should be encouraged at all stages and in all sectors of education. Opportunities for part time employment should be provided for them on a large scale.⁵

5. Suresh Bhatnagar, 'Kothari Commission' (*Recommendations and Evaluation*), International Publishing House, Meerut, 1967, p. 24.

TABLE 4.1 : The Pupil Enrolment in Primary Schools
in Andhra Pradesh

<i>Years</i>	<i>Boys</i>	<i>Girls</i>	<i>Total</i>
1956-57	1499555	869754	2369309
1957-58	1559161	937652	2496813
1958-59	1593693	959373	2553066
1959-60	1667033	1013121	2680154
1960-61	1742127	1075079	2817206
1961-62	1831630	1232779	3064409
1962-63	1873417	1285835	3159252
1963-64	1922357	1326414	3248771
1964-65	1856336	1276559	3132895
1965-66	1884534	1299830	3184364
1966-67	1875709	1286414	3162123
1967-68	1866696	1286680	3153376
1968-69	1894139	1295785	3189924
1969-70	1869196	1269713	3138909
1970-71	1844670	1243629	3088299
1971-72	1849225	1221632	3070857
1972-73	1866745	1255137	3121882
1973-74	1862950	1273796	3136746
1974-75	1864995	1266922	3131917
1975-76	1867138	1282614	3149752
1976-77	1924759	1311176	3235935
1977-78	2098979	1449205	3548184
1978-79	2185859	1533433	3719292
1979-80	2242261	1588357	3830618

Source : The Office of the Directorate of School Education, Hyderabad
(A.P.).

TABLE 4.2 : The Enrolment of Students in Primary Schools and Primary Sections of Upper Primary Schools and Higher Secondary Schools—Andhra Pradesh

<i>Years</i>	<i>Boys</i>	<i>Girls</i>	<i>Total</i>
1956-57	1544039	910015	2454054
1957-58	1600220	966580	2566800
1958-59	1658245	1000831	2659076
1959-60	1743486	1062965	2806451
1960-61	1840664	1135391	2976055
1961-62	2040347	1361318	3401665
1962-63	2097574	1420792	3518366
1963-64	2142653	1461718	3604371
1964-65	2141756	1454817	3596573
1965-66	2245983	1523191	3769174
1966-67	2305969	1553425	3859394
1967-68	2318275	1572903	3891178
1968-69	2245243	1589547	3934790
1969-70	2331634	1572320	3903954
1970-71	2325140	1557736	3882876
1971-72	2351822	1549734	3901556
1972-73	2390853	1600613	3991466
1973-74	2405283	1634706	4039989
1974-75	2444602	1649101	4093703
1975-76	2456701	1677753	4134454
1976-77	2545236	1725449	4273685
1977-78	2774450	1901457	4675907
1978-79	2901325	2024159	4925484
1979-80	2992614	2098167	5090781

Source : The Office of the Directorate of School Education, Hyderabad (A.P.).

TABLE 4.2(A) : Enrollment Index in Primary Education in Andhra Pradesh*

<i>Years</i>	<i>Population estimated in Lakhs</i>	<i>Students' enrolment in Lakhs</i>	<i>Enrolment index</i>
1956-57	338.74	24.54	724
1957-58	344.10	25.67	746
1958-59	355.00	26.59	749
1959-60	357.50	28.06	789
1960-61	359.83	29.76	827
1961-62	368.63	34.02	923
1962-63	377.42	35.18	932
1963-64	386.40	36.04	933
1964-65	392.16	35.97	917
1965-66	398.00	37.69	947
1966-67	403.93	38.59	955
1967-68	409.95	38.91	949
1968-69	416.06	39.35	945
1969-70	422.26	39.03	924
1970-71	428.55	38.83	906
1971-72	435.03	39.02	897
1972-73	449.06	39.91	888
1973-74	459.12	40.40	880
1974-75	469.62	40.94	872
1975-76	480.59	41.34	860
1976-77	490.83	42.74	870
1977-78	501.28	46.76	933
1978-79	511.96	49.25	962
Mean	415.5	36.9	SD 883.8 69.5

* Enrolment Index = $\text{Enrolment at Primary stage} / \text{population} \times 10000$.

Source : (1) Office of the Directorate of School Education, A.P.

(2) Annual Statistical Abstracts.



TABLE 4.3 : No. Of Primary Schools By Management—Andhra Pradesh

Years	Central Govt.	State Govt.	Panchayathi Samithi	Municipal	Private aided	Private unaided	Total
1956-57	20	7501	10512	494	10400	149	29076
1957-58	20	8422	10835	503	9996	19	29795
1958-59	60	8870	12136	600	9443	16	31125
1959-60	26	4793	23975	1084	2656	22	32556
1960-61	36	4127	26721	1071	2068	17	34040
1961-62	36	3701	29768	1115	2052	18	36690
1962-63	36	2325	31988	1164	2006	47	37566
1963-64	37	1394	33417	1178	1997	30	38053
1964-65	28	843	33626	1133	1878	35	37543
1965-66	30	937	33240	1141	1915	57	37320
1966-67	29	965	33860	1109	1877	66	36906
1967-68	30	958	32812	1134	1891	83	36908
1968-69	27	924	32791	1128	1896	113	36879
1969-70	28	947	32706	1145	1931	111	36868
1970-71	30	858	32879	1169	1960	117	37013
1971-72	28	846	32703	1160	1927	162	36826
1972-73	30	774	32715	1168	2006	112	36805
1973-74	28	870	32706	1169	2022	149	36944

1974-75	28	829	32786	1178	2033	185	37039
1975-76	30	854	32787	1185	2020	220	37096
1976-77	31	867	33334	1196	2029	249	37720
1977-78	31	892	34414	1198	2028	273	38836
1978-79	25	1084	35118	1156	2063	250	39696
1979-80	NA	NA	35195	NA	NA	NA	39955

Source : The Office of the Directorate of School of Education, Hyderabad, A.P.

TABLE 4.3.(A) : Number of Primary Schools—Sex-wise
in Andhra Pradesh

<i>Years</i>	<i>Boys Schools</i>	<i>Girls Schools</i>	<i>Total</i>
1956-57	28586	490	29076
1957-58	29342	453	29795
1958-59	30685	440	31125
1959-60	32122	434	32556
1960-61	33613	427	34040
1961-62	36255	435	36690
1962-63	37123	443	37566
1963-64	37619	434	38053
1964-65	37543	—	37543
1965-66	37320	—	37320
1966-67	36906	—	36906
1967-68	36908	—	36908
1968-69	36877	—	36879
1969-70	36868	—	36868
1970-71	37013	—	37013
1971-72	36826	—	36826
1972-73	36805	—	36805
1973-74	36944	—	36944
1974-75	37099	—	37039
1975-76	37036	—	37096
1976-77	37261	459	37720
1977-78	38448	388	38836
1978-79			39696
1979-80			39955

Source : The Office of the Directorate of School Education, Hyderabad, A.P.

TABLE 4.4 : Statement Showing Number of Teachers in Primary Schools in Andhra Pradesh

Years	Men	Women	Total	Trained Teachers	
				Men	Women
1956-57	63446	13759	77205	49656	12289
1957-58	60930	13302	74232	49779	12174
1958-59	62129	13529	75658	51100	12463
1959-60	63184	14062	77246	52676	13157
1960-61	63897	14624	78521	53940	13865
1961-62	65619	15612	81231	54420	14580
1962-63	66852	16447	83299	57424	15421
1963-64	69501	17280	86781	61600	16290
1964-65	63978	16560	80538	57834	15767
1965-66	63253	16670	79923	58470	15711
1966-67	62006	16258	78264	58378	15399
1967-68	61601	16178	77779	58947	15574
1968-69	61236	16502	77738	59085	15960
1969-70	61288	16729	78017	59849	16224
1970-71	62050	17122	79172	60868	15779
1971-72	61134	17438	78572	59994	17113
1972-73	60567	17822	78389	59588	17473
1973-74	60779	18431	79210	59866	18104
1974-75	60219	18736	78955	59351	18446
1975-76	59884	19130	79014	59007	18826
1976-77	59663	19730	79393	58804	19441
1977-78	59728	19837	79565	58869	19511
1978-79	57401	21401	78802	56565	21108

Source : The Office of the Directorate of School Education, Hyderabad, Andhra Pradesh.

TABLE 4.5 : Percentage of Enrolment of Boys in Primary Education in Andhra Pradesh

<i>Years</i>	<i>Enrolment</i>	<i>Population</i>	<i>Percentage</i>
1956-57	1544039	2133200	72.38
1957-58	1600220	2145700	74.58
1958-59	1658245	2158300	76.83
1959-60	1743486	2170800	80.32
1960-61	1840664	2183300	84.31
1961-62	2040347	2239600	91.10
1962-63	2097574	2295900	91.36
1963-64	2142653	2352300	91.09
1964-65	2141756	2408600	89.92
1965-66	2245983	2465133*	91.11
1966-67	2305969	2560765	90.05
1967-68	2318275	2656439	87.27
1968-69	2345243	2752309	85.21
1969-70	2331634	2847971	81.87
1970-71	2325140	2943960	78.98
1971-72	2351822	3018252	77.92
1972-73	2390853	3092553	77.31
1973-74	2405283	3166929	75.95
1974-75	2444602	3240029	75.45
1975-76	2456701	3313597	74.14
1976-77	2548236	3313701	76.00
1977-78	2774450	3383475	82.24
1978-79	2901325	3413324	85.00

*From 1965-66, Computed values or Population estimates.

Source : (1) The Office of the Directorate of School Education, Hyderabad, A.P.

(2) Population of the Children in the age-group of 6+ and 10+ years.

TABLE 4.6 : Percentage of Enrolment of Girls Primary Education in Andhra Pradesh

<i>Years</i>	<i>Enrolment</i>	<i>Population</i>	<i>Percentage</i>
1956-57	910015	2102600	43.28
1957-58	966580	2122000	45.55
1958-59	1000831	2141400	46.74
1959-60	1062965	2160900	49.19
1960-61	1276055	2435980	68.26
1961-62	1361318	2233500	60.95
1962-63	1420792	2290600	62.03
1963-64	1461718	2347600	62.26
1964-65	1454817	2404600	60.50
1965-66	1523191	2461523	61.88
1966-67	1553425	2552875	60.85
1967-68	1572903	2643978	59.49
1968-69	1589547	2735410	58.11
1969-70	1572320	2826896	55.62
1970-71	1557736	2917655	53.39
1971-72	1549734	2975679	52.08
1972-73	1600613	3033792	52.76
1973-74	1634706	3091935	52.87
1974-75	1649101	3148942	52.37
1975-76	1677753	3206102	52.33
1976-77	1725449	3300400	54.28
1977-78	1901475	3499218	54.40
1978-79	2024159	3551156	57.00

Source : 1. The Office of the Directorate of School Education, Hyderabad, A.P.

2. Population of the children in the age group of 6+ and 10+ years.

TABLE 4.7 : The Enrolment of the Children in Primary Education in Andhra Pradesh

<i>Years</i>	<i>Enrolment</i>	<i>Population</i>	<i>Percentage</i>
1956-57	2454054	4235800	57.94
1957-58	2566800	4267700	60.14
1958-59	2659076	4299700	61.84
1959-60	2806451	4331700	64.79
1960-61	2976055	4359800	68.26
1961-62	3401665	4473100	76.05
1962-63	3518366	4586500	76.71
1963-64	3604371	4699900	76.69
1964-65	3596573	4813200	74.72
1965-66	3769174	4927024	76.50
1966-67	3859394	5118559	75.47
1967-68	3891178	5300610	73.41
1968-69	3934790	5487852	71.70
1969-70	3903954	5675176	68.79
1970-71	3882876	5861829	66.24
1971-72	3901556	5994094	65.09
1972-73	3991466	6126578	65.15
1973-74	4039989	6258697	64.55
1974-75	4093703	6389423	64.07
1975-76	4134454	6520192	63.41
1976-77	4273685	6482155	65.93
1977-78	4675907	6449527	72.50
1978-79	4925484	6413391	76.80
1979-80	5090781	6284915	81.00
		Mean	69.49
		S.D.	6.23

Source : The Office of the Directorate of School Education, Hyderabad, A.P.

TABLE 4.8 : Cycles in the Enrolment of Boys and Girls in I Class and NDP at 1960-61 Prices in A.P.

<i>Years</i>	<i>Percentage change in the enrolment of Boys</i>	<i>Percentage change in the enrolment of Girls</i>	<i>Percentage change in NDP</i>
1956-57	—	—	—
1957-58	6.38	5.92	3.45
1958-59	3.39	2.84	7.78
1959-60	5.41	5.79	2.06
1960-61	7.76	8.03	1.01
1961-62	18.34	34.60	7.64
1962-63	-2.36	0.08	-0.27
1963-64	-1.82	-3.32	5.39
1964-65	-3.83	-7.12	7.06
1965-66	3.95	1.37	-9.08
1966-67	3.72	1.57	3.90
1967-68	0.34	-.60	3.42
1968-69	-.79	-.63	-3.73
1969-70	-4.04	-4.28	9.07
1970-71	1.03	0.45	9.27
1971-72	1.67	-2.70	3.54
1972-73	-.84	1.29	-6.77
1973-74	-1.34	-.56	15.77
1974-75	0.66	1.44	3.97
1975-76	1.78	2.24	3.34
1976-77	8.34	10.12	-6.40
1977-78	9.74	13.34	11.57
1978-79	6.10	9.81	7.65
Mean	2.89	3.62	3.62
S.D.	5.12	8.33	5.98

Sources : Table 4.9, Table 4.10.

S.D. : Standard Deviation.

TABLE 4.9 : Class-wise Enrolment of Boys in Primary Education in Andhra Pradesh

Years	I Class	II Class	III Class	IV Class	V Class	Total
1956-57	588408	327835	254556	199313	173927	1544039
1957-58	625944	332173	262142	205528	174433	1600220
1958-59	647165	346661	269527	214088	180804	1658245
1959-60	682161	362623	283487	224513	190702	1743486
1960-61	735078	387733	296309	230853	190691	1840664
1961-62	869899	409520	318523	241213	201192	2040347
1962-63	849338	447314	335588	258442	206892	2097574
1963-64	833917	459200	352768	271408	225360	2142653
1964-65	802002	465032	359695	284056	230971	2141756
1965-66	833681	487352	382741	295377	246832	2245983
1966-67	864713	501988	391549	300113	247606	2305969
1967-68	867667	511843	398816	307873	252070	2318275
1968-69	860787	509076	400546	311513	263321	2345243
1969-70	825951	505644	403760	323175	273104	2331634
1970-71	834499	506418	396929	321609	265685	2325140
1971-72	848466	582709	399239	319854	265984	2351822
1972-73	841334	521365	418565	333000	276589	2390853
1973-74	830028	520453	423081	345131	286590	2405283
1974-75	835533	530100	427393	352266	298810	2444602

1975-76	850370	527012	423628	354233	301458	2456701
1976-77	921310	539028	432732	354382	300784	2545236
1977-78	1011014	590534	466897	378026	327927	2774450
1978-79	1072719	623555	490694	388072	326285	2901325

Source : The Office of the Directorate of School Education, Government of Andhra Pradesh.

TABLE 4.10 : Class-wise Enrolment of Girls in Primary Education in Andhra Pradesh

Years	I Class	II Class	III Class	IV Class	V Class	Total
1956-57	389589	198272	143120	101337	77697	910015
1957-58	412660	211773	152670	107571	81906	966580
1958-59	424365	219782	160175	112789	83720	1000831
1959-60	448951	232149	169475	121180	91210	1062965
1960-61	484986	249331	179025	127090	94959	1135391
1961-62	652798	272126	197731	137106	101557	1361318
1962-63	653346	307480	206267	146194	107505	1420792
1963-64	631685	326928	227577	157350	118178	1461718
1964-65	586703	335586	236402	171583	124543	1454817
1965-66	594721	352869	238142	183319	134140	1523191
1966-67	604030	357349	282515	188139	141392	1553425
1967-68	600396	347076	277324	197811	150296	1572903
1968-69	596613	358294	276153	202196	156191	1589547
1969-70	571103	355428	277979	207974	159836	1572320
1970-71	573666	351583	272722	204045	155720	1557736
1971-72	558133	350171	268131	208350	164949	1549734
1972-73	565330	368119	279227	216571	171366	1600613
1973-74	562161	368465	291096	232854	180130	1634706
1974-75	570246	371071	295706	230946	181132	1649101

1975-76	583024	376700	293731	236325	187937	1677753
1976-77	642036	373152	295167	231966	183188	1725449
1977-78	727706	416074	313846	245910	197921	1901457
1978-79	799098	442220	329690	250815	202336	2024159

Source : The Office of the Directorate of School Education, Andhra Pradesh.

TABLE 4.11 : School Efficiency—Enrolment Ratio in
Primary Education—A.P.
(BOYS)

Years	I Class	II Class	III Class	IV Class	V Class	Remarks
1956-57	100					
1957-58	100	56				
1958-59	100	55	46			
1959-60	100	56	45	38		
1960-61	100	57	42	37	32	
1961-62	100	56	47	37	32	
1962-63	100	51	46	38	32	
1963-64	100	54	41	37	33	
1964-65	100	56	42	33	31	
1965-66	100	61	46	35	28	
1966-67	100	60	49	36	29	
1967-68	100	60	48	38	30	
1968-69	100	59	46	37	33	
1969-70	100	59	47	37	33	
1970-71	100	61	46	37	31	
1971-72	100	69	48	37	31	
1972-73	100	61	50	40	32	
1973-74	100	62	50	41	35	
1974-75	100	64	51	42	36	
1975-76		63	51	42	36	
1976-77		52	52	43	36	
1977-78				45	40	
1978-79					39	
Mean		56	47	38	33	
S.D.		11.8	3.0	2.9	3.1	

Source : Table 4.9.

S.D. : Standard Deviation.

TABLE 4.12 : School Efficiency—Enrolment Ratio in
Primary Education—A.P.
(GIRLS)

<i>Years</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Remarks</i>
1956-57	100				
1957-58	100	54			
1958-59	100	53	41		
1959-60	100	54	41	31	
1960-61	100	55	42	31	24
1961-62	100	56	43	32	25
1962-63	100	47	43	32	25
1963-64	100	50	35	32	26
1964-65	100	53	36	26	26
1965-66	100	60	38	28	21
1966-67	100	60	48	30	22
1967-68	100	57	47	34	24
1968-69	100	60	46	34	27
1969-70	100	60	46	34	27
1970-71	100	62	46	34	26
1971-72	100	61	47	35	27
1972-73	100	66	49	38	29
1973-74	100	65	52	41	32
1974-75	100	66	52	41	32
1975-76		66	52	42	34
1976-77			52	41	32
1977-78				43	35
1978-79					35
Mean		58	45	35	27
S.D.		5.4	5.2	4.8	4.2

Source : Table 4.10.

S.D. : Standard Deviation.

TABLE 4.13 : Input-Output Ratios in Primary Education—Boys—A.P.

<i>Years</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Mean</i>
1956-57	1.8				
1957-58	1.8	1.2			
1958-59	1.8	1.2	1.2		
1959-60	1.8	1.3	1.2	1.2	1.35
1960-61	1.8	1.2	1.1	1.2	1.35
1961-62	1.9	1.2	1.2	1.1	1.33
1962-63	1.9	1.2	1.2	1.1	1.33
1963-64	1.8	1.3	1.2	1.2	1.35
1964-65	1.6	1.2	1.2	1.2	1.38
1965-66	1.7	1.5	1.2	1.2	1.4
1966-67	1.7	1.3	1.3	1.2	1.35
1967-68	1.7	1.3	1.3	1.2	1.4
1968-69	1.7	1.3	1.2	1.1	1.35
1969-70	1.6	1.3	1.3	1.2	1.35
1970-71	1.4	1.3	1.2	1.2	1.38
1971-72	1.6	1.4	1.2	1.2	1.35
1972-73	1.6	1.2	1.2	1.1	1.30
1973-74	1.6	1.2	1.2	1.1	1.30
1974-75	1.6	1.3	1.2	1.2	1.30
1975-76		1.2	1.2	1.2	1.30
1976-77			1.2	1.1	1.30
1977-78				1.2	1.30
1978-79					
Mean	1.70	1.30	1.20	1.20	1.30
S.D.	0.13	0.08	0.04	0.05	0.03

Source : Table 4.9.

S.D. : Standard Deviation.

TABLE 4.14 : Input-Output Ratios in Primary Education—Girls—A.P.

Years	Class I	Class II	Class III	Class IV	Mean
1956-57	1.9				
1957-58	1.9	1.3			
1958-59	1.9	1.3	1.3		
1959-60	1.8	1.3	1.3	1.3	1.45
1960-61	1.8	1.3	1.3	1.2	1.43
1961-62	2.1	1.3	1.3	1.3	1.45
1962-63	2.0	1.3	1.3	1.2	1.40
1963-64	1.9	1.4	1.3	1.2	1.40
1964-65	1.7	1.4	1.3	1.2	1.47
1965-66	1.7	1.3	1.3	1.3	1.5
1966-67	1.8	1.3	1.4	1.3	1.48
1967-68	1.7	1.2	1.4	1.3	1.43
1968-69	1.7	1.3	1.4	1.3	1.43
1969-70	1.6	1.3	1.3	1.3	1.43
1970-71	1.6	1.3	1.3	1.3	1.40
1971-72	1.5	1.2	1.2	1.2	1.38
1972-73	1.5	1.3	1.2	1.2	1.33
1973-74	1.5	1.3	1.3	1.3	1.33
1974-75	1.5	1.3	1.2	1.2	1.33
1975-76		1.3	1.3	1.3	1.33
1976-77			1.2	1.2	1.33
1977-78				1.2	1.30
1978-79					
Mean	1.74	1.3	1.3	1.3	1.4
S.D.	0.18	0.05	0.06	0.05	0.06

Source : Table 4.10.

S.D. : Standard Deviation.

TABLE 4.15 : Output of Primary Schools, Literacy Rates, and Per Capita Income in Different States

<i>States</i>	<i>Output</i>	<i>Literacy rate</i>	<i>Per Capita Income</i>
Kerala	813	60.16	505
Maharashtra	658	39.08	731
Tamil Nadu	495	39.39	601
Jammu and Kashmir	491	18.30	—
Gujarat	488	35.72	657
Mysore	425	31.54	515
Assam	359	28.81	545
Rajasthan	323	18.79	480
Madhya Pradesh	314	22.12	534
Andhra Pradesh	302	24.56	513
Bihar	301	19.79	402
Orissa	224	26.12	325

Source : See C.B. Padmanabhan, *Teacher Today*, April, June 1975, 'Output of Primary Schools in Different States', as presented in K. Venkata Subramanian, *Wastage in Primary Education*, published by Orient Langmans, 1978, p. 42.

TABLE 4.16 : District-wise Enrolment in Primary Schools during the Year 1978-79 in Andhra Pradesh

S.No	District	Boys	Girls	Total	%
1.	Srikakulam	157511	122137	279648	7.5
2.	Vishakapatnam	148709	98947	247656	6.7
3.	East Godavari	158747	147268	306015	8.1
4.	West Godavari	140913	137643	278556	7.5
5.	Krishna	133612	118381	251993	6.8
6.	Guntur	173929	134671	308600	8.3
7.	Prakasham	142182	102879	245061	6.6
8.	Nellore	103422	80644	184066	4.9
9.	Kurnool	125934	80672	206606	5.6
10.	Ananthapur	130893	73400	204293	5.5
11.	Cuddapah	105386	68459	173845	4.7
12.	Chittoor	147383	100342	247725	6.7
13.	Hyderabad	71804	51803	123607	3.3
14.	Nizamabad	61523	28210	89733	2.4
15.	Medak	33145	13614	46759	1.3
16.	Mahaboobnagar	66078	31181	97259	2.6
17.	Nalgonda	77476	39534	117010	3.1
18.	Warangal	57551	29206	86757	2.3
19.	Khammam	47753	30466	78219	2.1
20.	Karimnagar	57172	26225	83397	2.2
21.	Adilabad	44736	17751	62487	1.7
Total		2185859	1533433	3719292	100

Source : A.P. Statistical Abstract, 1979.

TABLE 4.17 : Class-wise Enrolment of Boys of Scheduled Castes in Primary Schools in Andhra Pradesh

Years	I Class	II Class	III Class	IV Class	V Class	Total	Percentage of the total enrolment
1964-65	122747	67920	45210	30505	25333	309169	14.4
1965-66	119724	72653	50412	32308	28821	303918	13.5
1966-67	122152	77622	49535	34013	27933	311255	13.5
1967-68	122499	72559	49835	33972	27029	305894	13.2
1968-69	124759	77341	51092	35146	32999	321337	13.7
1969-70	108144	68839	50024	36514	29964	293483	12.6
1970-71	103018	64010	43588	32739	25010	269165	11.6
1971-72	115715	68649	48466	36772	27636	297238	12.6
1972-73	120867	76796	57263	43325	30596	328847	13.8
1973-74	120002	76696	56820	44991	33385	331894	13.8
1974-75	127651	76349	59180	46284	33347	342811	14.0
1975-76	121682	78397	59799	46726	35258	341862	13.9
1976-77	154437	82436	60968	48666	37226	383733	15.1
1977-78	179630	95427	68678	53488	40755	437979	15.8
1978-79	241844	111135	80251	58178	45024	526432	18.1
Percentage increase during the period	88	63	77	90	78	70	Mean 1.40 S.D. : 1.45

Source : The Office of the Directorate of School Education, Hyderabad (A.P.). S.D. : Standard Deviation.

TABLE 4.18 : Class-wise Enrolment of Girls of Scheduled Castes in Primary Schools in Andhra Pradesh

Years	I Class	II Class	III Class	IV Class	V Class	Total	Percentage of the total enrolment
1964-65	83385	45346	28833	17898	15522	190984	13.1
1965-66	83870	47602	29814	19301	16450	197037	12.9
1966-67	82290	48833	30214	20949	17988	200274	12.9
1967-68	84284	45007	29181	19452	18563	196487	12.5
1968-69	85387	48973	31243	24038	21516	211157	13.3
1969-70	71990	49262	32997	24118	22238	200605	12.8
1970-71	67192	44188	27948	22064	16097	177489	11.4
1971-72	77724	45883	31190	23274	18207	196298	12.7
1972-73	73235	48830	34242	27575	20540	204422	12.8
1973-74	73417	50203	39908	27652	20088	209268	13.1
1974-75	75979	49926	36602	26936	20904	210347	12.9
1975-76	76956	50715	39301	28852	20812	216636	13.1
1976-77	98415	51691	38414	29821	23255	241596	14.4
1977-78	118916	59537	42371	32244	25266	278334	14.6
1978-79	176477	74086	49398	35534	25769	359264	17.7
Percentage increase during the period	111	63	71	98	66	88	Mean 13.3 S.D. : 1.36

Source : The Office of the Directorate of School Education, Hyderabad (A.P.). S.D. : Standard Deviation.

TABLE 4.19 : Class-wise Enrolment of Boys of Scheduled Tribes in Primary Schools in Andhra Pradesh

Years	I Class	II Class	III Class	IV Class	V Class	Total	Percentage of the total enrolment
1964-65	24170	12076	7205	5182	3220	51853	2.4
1965-66	25755	14983	10203	7239	4520	62700	2.8
1966-67	23767	14114	10515	7178	4505	60079	2.6
1967-68	23886	14161	9947	7088	4797	59879	2.6
1968-69	28202	14471	9459	6569	5053	63754	2.7
1969-70	26216	14145	9643	6723	4919	61646	2.6
1970-71	26789	14174	10335	7544	5666	64608	2.8
1971-72	28718	14867	10282	7813	5776	67456	2.9
1972-73	31175	15632	11485	8201	5532	72025	3.0
1973-74	29975	16364	12775	9181	7004	75299	3.1
1974-75	28618	16529	12180	8924	6865	73116	3.0
1975-76	28685	16540	13171	9680	8017	76093	3.1
1976-77	43933	18235	13147	9628	7528	92561	3.6
1977-78	48698	21666	15350	11237	9182	106133	3.8
1978-79	75165	32506	19466	12456	8970	148563	5.1
Percentage increase during the period	210	169	170	140	178	186	Mean = 3.1 S.D. : 0.65

Source : The Office of the Directorate of School Education, Hyderabad (A.P.). S.D. : Standard Deviation.

TABLE 4.20 : Class-wise Enrolment of Girls of Scheduled Tribes in Primary Schools in Andhra Pradesh

Years	I Class	II Class	III Class	IV Class	V Class	Total	Percentage of the total enrolment
1964-65	13835	5185	3468	2494	1695	26677	1.8
1965-66	13787	8278	5296	3550	2473	33384	2.2
1966-67	12107	8367	5893	4041	2485	32893	2.1
1967-68	11107	7800	5596	4045	2260	30808	2.0
1968-69	14930	7775	4934	3423	2115	33177	2.1
1969-70	14384	8112	5593	3621	2091	33801	2.1
1970-71	14901	8669	5582	4316	3614	37082	2.3
1971-72	15594	8849	5660	4186	2880	37169	2.4
1972-73	16436	9225	6249	4393	2927	39230	2.5
1973-74	16639	9815	6982	5123	3560	42119	2.5
1974-75	15476	9663	7255	4820	3023	40237	2.4
1975-76	16235	9945	7475	5498	3806	42959	2.6
1976-77	23112	9387	6382	4653	3760	46694	2.7
1977-78	27860	11932	7570	4989	3848	56199	2.9
1978-79	45930	16709	8781	5236	3348	80004	3.9
Percentage increase during the period	231	222	153	109	97	109	Mean 2.4 S.D. : 0.48

Source : The Office of the Directorate of School Education, Hyderabad (A.P.). S.D. : Standard Deviation.

TABLE 4.20(A) : The Enrolment of Children in Primary Schools
District-wise in Andhra Pradesh—1978

<i>District</i>	<i>No of primary school</i>	<i>Per- cent</i>	<i>Enrol- ment of Boys</i>	<i>Per- cent</i>	<i>Enrol- ment of Girls</i>	<i>Per- cent</i>
1. Srikakulam	3122	8	157511	7	122137	8
2. Vishakapatnam	2438	6	148709	7	98947	6
3. East Godavari	2435	6	158747	7	147268	10
4. West Godavari	2168	5	140913	6	137643	9
5. Krishna	2250	6	133612	6	118381	8
6. Guntur	2422	6	173929	8	134671	9
7. Prakasham	2292	6	142182	7	102879	7
8. Nellore	2207	6	103422	5	80644	5
9. Karnool	1715	4	125934	6	80672	5
10. Anantapur	2278	6	130893	6	73400	5
11. Cuddapah	2171	5	105386	5	68459	4
12. Chittoor	2733	7	147383	7	100342	7
13. Hyderabad	1242	3	71804	3	51803	3
14. Nizamabad	1313	3	61523	3	28210	2
15. Medak	773	2	33145	2	13614	1
16. Mahabubnagar	1659	4	66078	3	31181	2
17. Nalgonda	1523	4	77476	4	39534	3
18. Warangal	1296	3	57551	3	29206	2
19. Khammam	1085	3	47753	2	30466	2
20. Karimnagar	1351	3	57172	3	26225	2
21. Adilabad	1223	3	44736	2	17751	1
Total	39696	190	2185859	100	1533433	100

Source : Andhra Pradesh Statistical Abstract, 1979. Percentages are rounded off.

TABLE 4.21 : The Teacher-Pupil Ratio in Primary Schools in Andhra Pradesh

<i>Years</i>	<i>The enrolment of pupils</i>	<i>Number of Teachers¹</i>	<i>Teacher pupils ratio</i>
1956-57	2369309	77205	31
1957-58	2496813	74232	34
1958-59	2553066	75658	34
1959-60	2680154	77246	35
1960-61	2817206	78521	36
1961-62	3064409	81231	38
1962-63	3159252	83299	38
1963-64	3248771	86781	37
1964-65	3132895	80538	39
1965-66	3184364	79923	40
1966-67	3162123	78264	40
1967-68	3153376	77779	41
1968-69	3189924	77738	41
1969-70	3138909	78017	40
1970-71	3088299	79172	39
1971-72	3070857	78572	39
1972-73	3121882	78389	40
1973-74	3136746	79210	40
1974-75	3131917	78955	40
1975-76	3149752	79014	40
1976-77	3235935	79393	41
1977-78	3548184	79565	45
1978-79	3719292	78802	47
Mean	3067541	79022	39
S.D.	301408	2408	3.3

Source : Tables 4.1 and 4.4. (1) The enrolment of Pupils represent only Primary Schools.

TABLE 4.22 : Primary School Teacher Index—Andhra Pradesh

Years	Primary School teachers ¹ in 000's	Population in 000's	Primary School teachers Index ²
1956-57	62.924	33.874	19
1957-58	65.815	34.410	19
1958-59	68.181	35.500	19
1960-61	76.309	35.983	21
1961-62	87.222	36.863	23
1962-63	90.214	37.742	24
1963-64	92.419	38.640	24
1964-65	90.219	39.216	24
1965-66	96.645	39.800	24
1966-67	98.959	40.393	24
1967-68	99.774	40.995	24
1968-69	100.892	41.606	24
1969-70	100.101	42.226	24
1970-71	99.561	42.855	23
1971-72	100.040	43.503	23
1972-73	102.345	44.906	23
1973-74	103.589	45.912	23
1974-75	104.967	46.962	22
1975-76	106.012	48.059	22
1976-77	109.582	49.083	22
1977-78	119.895	50.128	24
1978-79	126.294	51.196	25

$$\text{Primary School Teacher Index} = \frac{\text{Number of Primary School Teachers}}{\text{Population}} \times 1000$$

(1) Teachers estimated at 1 : 39.

(2) The figures are rounded off to nearest integer.

Source : Table 4.2 and Statistical Abstract.

TABLE 4.23 : Trained Teachers in Primary Schools in Andhra Pradesh

<i>Years</i>	<i>Total teachers</i>	<i>Trained teachers</i>	<i>Percentage of the trained teachers*</i>
1956-57	77205	61945	80
1957-58	74232	61953	83
1958-59	75658	63563	84
1959-60	77246	65833	85
1960-61	78521	67805	86
1961-62	81231	69000	85
1962-63	83299	72845	87
1963-64	86781	77890	90
1964-65	80538	73601	91
1965-66	79923	74181	92
1966-67	78264	73777	94
1967-68	77779	74521	96
1968-69	77738	75045	97
1969-70	78017	76073	98
1970-71	79172	77647	98
1971-72	78572	77107	98
1972-73	78389	77061	98
1973-74	79210	77970	98
1974-75	78955	77797	99
1975-76	79014	77833	99
1976-77	79393	78245	99
1977-78	79565	78380	99
1978-79	78802	77673	99

Source : Table 4.4.

* Percentages are rounded off.

TABLE 4.24 : Women Teachers in Primary Education
in Andhra Pradesh

<i>Years</i>	<i>Number of teachers</i>	<i>Women teachers</i>	<i>Percentage of women teachers</i>	<i>Percentage of trained women teachers (Women only)</i>
1956-57	77205	13759	18	89
1957-58	74232	13302	18	91
1958-59	75658	13529	18	92
1959-60	77246	14062	18	94
1960-61	78521	14624	19	94
1961-62	81231	15612	19	93
1962-63	83299	16447	20	94
1963-64	86781	17280	20	94
1964-65	80538	16560	21	95
1965-66	79923	16670	21	94
1966-67	78264	16258	21	95
1967-68	77779	16178	21	96
1968-69	77738	16502	21	97
1969-70	78017	16729	21	97
1970-71	79172	17122	22	98
1971-72	78572	17438	22	98
1972-73	78389	17822	23	98
1973-74	79210	18431	23	98
1974-75	78955	18736	24	98
1975-76	79014	19130	24	98
1976-77	79393	19730	25	98
1977-78	79565	19837	25	98
1978-79	78802	21401	27	98
Mean			21.3	
S.D.			2.46	

Source : Table 4.4 (I). Percentages are rounded off.

Investment in Primary Education in Andhra Pradesh

Investment in Human Capital

Although it is obvious that people acquire useful skills and knowledges, it is not obvious that these skills and knowledge are a form of capital, that this capital is in substantial part a product of deliberate investment.¹

The economists have come to recognise that people invest in themselves and these investments are very large, these skills are like property, the marketable asset, and human beings may be treated as capital goods. The knowledge and skills acquired by the people have economic value. The additional education, one acquires, will tend to improve productivity. In recent times the stock of human capital has been increasing in all countries as a result of deliberate investment.

It is difficult to estimate the magnitude of human investment, because of our failure to distinguish between expenditures for consumption and for investment. The expenditure on education is partly consumption and partly investment, and the task of identifying each component is formidable. Human investments include expenditures on health, training, education, agriculture and other programmes intended to promote human welfare.

The conventional costs of education consist of services of teachers, librarians, administrators and of maintaining and

1. T.W. Schultz, "Investment in Human Capital," in *Economics of Education*, Edited by M. Blaug, p. 13.

operating the educational plant, and interest on the capital invested. The income foregone by the students is another component of total costs.²

Investment in Education—A.P.

The political leaders of third world nations have been under great pressure to provide free primary or elementary schooling for all children. Education is one of the basic rights set out by the United Nations, the overcoming of ignorance was a means for improving the quality of life.³

The expenditure on education in Andhra Pradesh, like in other States, has been rising since 1956-57. Table 5.1 displays upward trend in the expenditure on education in Andhra Pradesh. The per capita expenditure on education in the State rose from Rs. 3.60 per year in 1956-57 to Rs. 23.95 per year in 1978-79. The data presented in Table 5.1 are summarised below :

<i>Years</i>	<i>Total expenditure on education (Rs. in lakhs)</i>	<i>Population lakhs</i>	<i>Per capita expenditure Rs. per year</i>
1956-57	1220.53	338.74	3.60
1978-79	12263.34	511.96	23.95

It is apparent from the statement that the investment in human capital, i.e., expenditure on education in the State rose by more than ten times while per the capita expenditure on education increased by nearly seven times. In 1956-57, the per capita expenditure on the education in Andhra Pradesh was Rs. 3.60 as against Rs. 5.31 at all India level. This implies that the per capita expenditure in Andhra Pradesh in 1956-57 was less than average per capita expenditure on education in India.

Public Expenditure on Education as Proportion of NDP

India ranks among third level countries, or semi-advanced countries, the expenditure on education in India was 1.7 per

2. T.W. Schultz, "Investment in Human Capital", in *Economics of Education*, Edited by M. Blaug, p. 25.

3. Richard D'Aeth, *Education and Development in the Third World*, Saxon House, D.C. Halth Ltd., England, p. 9.

cent of the national income as against 4 per cent in Venezuela and 7 per cent in USSR in 1961. The average expenditure on education as percentage of national income in all third level countries according to human resource development, was 3.1 as against 1.7 in India. Public expenditure on education as a percentage of national income, may be taken as a good indicator of human resource development.

Table 5.2 presents encouraging evidence to show that the public expenditure on education as percentage of National Domestic Product has been rising in Andhra Pradesh. The average public expenditure on education as a percentage of NDP was 2.07 during the period 1956-57 to 1978-79 under study. The data presented in Table 5.2 are summarised below :

<i>Years</i>	<i>NDP at current prices (Rs. in crores)</i>	<i>Public expenditure on education (Rs. in crores)</i>	<i>Expenditure on education as percentage of NDP</i>
1956-57	587.61	6.72	0.78
1978-79	5301.28	173.28	3.27

It is apparent from the statement that public expenditure on education in Andhra Pradesh as a percentage of NDP increased by more than four times as against more than ten fold increase in expenditure on education. In 1956-57 the public expenditure on education as percentage of NDP was 0.78 and it rose to 3.27 the all time high in 1978-79. The expansion in public expenditure on education was faster than increases in NDP at current prices in the State.

Public Expenditure on Primary Education

Popular enlightenment is the key to all economic development. Primary education will promote people's participation in democratic government. The educational system should provide equality of opportunities which democracy proclaims and that widespread schooling is needed for democratic government. Equality of educational opportunity has been widely proclaimed as a 'Universal human right' and modern States are committed to provide free elementary schooling to all people. The popula-

tion of the State would be better prepared for modern life if half the population receives atleast five years of schooling.

The objective of educational policy should be to evolve a common school system of public education, which would provide equality of access to all children and will maintain such a standard that an average parent will not feel the need to send the child to an independent or unrecognised school.⁴

Public expenditure on primary education in Andhra Pradesh has shown upward trend as displayed in Table 5.3. In 1956-57 public expenditure on primary education was Rs. 6.22 crores and rose to Rs. 48.45 crores in 1978-79. Table 5.3 displays upward trend in unit cost or per pupil expenditure on primary education in Andhra Pradesh. The per pupil public cost in primary education rose from Rs. 25.38 per year in 1956-57 to Rs. 98.37 per year in 1978-79. The data presented in Table 5.3 are summarised below :

<i>Years</i>	<i>Public expenditure on primary education (Rs. in Lakhs)</i>	<i>Total enrolment in primary education in lakhs</i>	<i>Unit cost or per pupil expenditure Rs.</i>
1951-57	622.76	24.54	25.38
1978-79	4845.05	49.25	98.37

The public expenditure on primary education in Andhra Pradesh rose by 678 per cent while unit cost has risen by 288 per cent during the period 1956-57 to 1978-79. The total enrolment in primary education in the State has doubled during the same period.

The price effect on public expenditure was sought to be eliminated. Hence public expenditure has been computed at 1960-61 prices. Table 5.4 shows disturbing trend in unit cost in primary education in the State. In 1956-57 the per pupil expenditure in primary education was Rs. 21.84 per year at 1960-61 prices, and reached the all time peak in 1959-60, i.e., Rs. 24.50. The per pupil expenditure in primary education

4. Suresh Bhatnagar, *Kothari Commission : Recommendation and Evaluation*, International Publishing House, Meerut, p. 86.

touched bottom, i.e., Rs. 14.53 in 1973-74. The fluctuations in unit cost at 1960-61 prices, reflect the differences in efficiency levels in primary education. In 1978-79, the unit cost at 1960-61 prices was Rs. 17.72 only, the decline in the per pupil cost at 1960-61 prices might indicate neglect on the part of government policy towards primary education.

Average Annual Public Expenditure on Primary Education as a Proportion of State's Revenues

What part of the State's revenues is spent on primary education? It is the usual question asked by a common man. In 1956-57 the public expenditure on primary education in Andhra Pradesh was nearly ten per cent of the State's revenues, while in 1970-71 only 5.68 per cent of state's revenues was spent on primary education. The data presented in Table 5.5 are summarised below :

Years	Total receipts of the State (Rs. in lakhs)	Public expenditure on primary educa- tion (Rs. in lakhs)	Percentage of State's receipts spent on primary education
1956-57	6232.63	622.77	9.99
1978-79	100083.00	4845.05	4.84

It is apparent from the statement that public expenditure on primary education as a percentage of State's revenues declined during the period under consideration. The increase in public expenditure on primary education during the period 1956-57 to 1978-79 was 778 per cent as against 1606 per cent increase of state's revenues. It implies that State's revenues increased faster than expansion in public expenditure on primary education. On an average only 6.89 per cent of State's revenues were spent on primary education per year during the period under consideration.

Average Annual Per Pupil Expenditure in Elementary Education

I—V Classes

It is natural to seek to know how much is spent on a child for 5 years of schooling. It can be reckoned from Table 5.3, that the public expenditure on a child for 5 years of primary

education was around Rs. 125, during the period 1956-57 to 1960-61, and it rose Rs. 336 during the period 1974-75 to 1978-79. The increase in public expenditure on an elementary school graduate was nearly two-fold during the period under study. The per pupil per years public expenditure in primary education rose by 6.07 per cent compound growth rate during the period of 1956-57 to 1978-79 as against 3.08 per cent compound growth rate in the total enrolment during the same period.

Growth Rates in States's Revenues and Public Expenditure on Education, and Public Expenditure on Primary Education

The increases in State's revenues are followed by increases in public support to education. The improvements in state's revenues are reflected in public support to social services including education and decline in State's income will have its impact on educational outlays. Table 5.6 displays trend in State's receipts and outlays on education. In 1957-58, the State's revenues rose by 62.15 per cent over previous year and the outlay on education increased by 54.23 per cent. The public expenditure on primary education showed an increase of 7.80 per cent in 1957-58 over previous year. In 1958-59, the public outlays on education were slashed down as a consequence of sudden decline in State's revenue growth rate. The rise and fall in growth rates of State's revenues are reflected in the growth rates of public expenditure on primary education, and aggregate educational outlays throughout the period, *i.e.*, 1957-58 to 1978-79. In recession year 1967-68, the decline in growth rates of State's revenues and public outlays on education, is evident from the Table 5.6. The average growth rates in State's revenues and public outlays on education were nearly equal during the period 1956-57 to 1978-79, *i.e.*, 15.95 per cent growth in State's revenues and 15.92 per cent in public expenditure on education. The mean growth rate in public expenditure on primary education during the entire period was only 10.03 per cent. It implies that expansion in public expenditure on primary education lagged behind the aggregate public outlay on education.

The Share of the Primary Education Expenditure in Aggregate Outlay on Education

An attempt is made to identify the trend in percentage share of primary education expenditure in total outlay on education.

The information collected from the office of the Directorate of School Education in respect of aggregate expenditure on education does not correspond to the data in Table 5.2 in respect of expenditure on education collected from Andhra Pradesh Annual Statistical Abstracts. For example the expenditure on education was Rs. 6.72 crores in 1956-57 (see column 3 Table 5.2). Whereas it was shown Rs. 12.20 lakhs in the records of the Directorate of School Education, Hyderabad, Andhra Pradesh. The discrepancy is noticed in respect of all the years. In 1978-79, the total expenditure on all educational institutions was Rs. 122.63 crores (as per the office of the Directorate of School Education), but it was shown as Rs. 173.28 crores in Andhra Pradesh Statistical Abstract.

Hence, the difficulty is mounted to find the exact magnitude of educational outlays. Therefore, the conclusions drawn tend to be imprecise. Nevertheless the same trend is perceived in respect of both the sources.

Table 5.7 exhibits declining trend in the share of primary education in total expenditure on all educational institutions. The data presented in Table 5.7 are summarised below :

<i>Years</i>	<i>Total expenditure on all educational institutions (Rs. in lakhs)</i>	<i>Public expenditure on primary schools (Rs. in lakhs)</i>	<i>Percentage share of the primary education</i>
1956-57	1220.53	622.77	51.00
1978-79	12263.34	4845.05	39.51

It is apparent from the statement that the share of the primary education in total outlay on education has declined during the period under consideration. The mean percentage share of the primary education was 34 during the entire period of 1956-57 to 1978-79.

Plan-wise Allocation

The percentage of funds allotted for primary education tended to decline from first plan to fourth plan. During the first plan period 56 per cent of the funds were allotted for primary education, and it declined to 35 per cent during subsequent second five year plan. The sharp decline in the

share of primary education in second plan might indicate increased allocation for higher education. It might be the result of upgrading primary schools into secondary schools, in which case it becomes increasingly difficult to separate expenditure incurred on primary education. During third plan, only 30 per cent of funds were allotted for primary education. In fourth five year plan its share further dwindled to 28.5 per cent.

Plan and Non-Plan Outlays

In 1969-70, the plan allocation was Rs. 15.38 lakhs. In 1973-74, the plan allocation for primary education rose to Rs. 265 lakhs, as against non-plan allocation of Rs. 3424.61 lakhs as shown in Table 5.8. The plan allocation in 1974-75 was reduced to Rs. 189.03 lakhs although over all allocation increased to Rs. 40.93 crores from Rs. 36.89 crores in previous year. The percentage plan allocation for primary education remained at 0.71 in 1969-70. The percentage plan allocation for primary education was only 5.29 in 1976-77.

The budget allocation for secondary education including primary education is shown in Table 5.8(A). The plan allocation for secondary education including primary education was Rs. 3.87 crores in 1973-74 and it declined to Rs. 3.66 crores in 1976-77, whereas non-plan outlay rose from Rs. 58.66 crores to Rs. 86.17 crores during the same period. The non-plan outlay happens to be greater than plan allocation.

The aggregate outlay on primary education rose from Rs. 21.69 crores to Rs. 50.30 crores during the period 1969-70 to 1976-77.

Our educational policy is concentrating on the top of a heavy structure with a weak very weak base. To have equality of opportunity there must be equality in primary education.⁵

Average Annual Per Pupil Expenditure in Primary Education as Percentage of NDP Per Capita

The National Domestic Product at current prices in Andhra Pradesh shows upward trend during the period under consideration, as shown in Table 5.9 col. 2. The unit cost *i.e.*, average

5. Suresh Bhatnagar, *Kothari Commission*, published by International Publishing House, Meerut, p. 49.

annual per pupil public expenditure, has increased by 288 per cent during the same period as against 518 per cent increase in NDP. What part of the NDP per capita is spent on primary education? The average annual per pupil expenditure as percentage of NDP per capita is taken as better index for the progress of primary education. In 1956-57, the unit cost formed 10.76 per cent in NDP per capita and declined as average annual per pupil expenditure on percentage of NDP per capita, shows ups and downs during the period under study. The mean value of the unit cost index was 8.34 per cent during the entire period, the standard deviation was 1.39. The data presented in Table 5.9 are summarised below :

Year	Unit cost Rs.	NDP per capita Rs.	Unit cost index $= \frac{\text{Unit cost} \times 100}{\text{NDP per capita}}$
1956-57	25.38	235.85	10.76
1978-79	98.37	1026.64	9.58
		Mean	8.34
		Standard Deviation	1.30

It is apparent from the Table 5.9 col. 3 that the unit cost index as defined earlier has shown erratic trends during the period under consideration. The fluctuations in the unit cost index might indicate changes in the efficiency level of primary education in Andhra Pradesh.

Total Public Support to Primary Education

The total public support to primary education includes interest on government outlay. Interest amount varies with the volume of investment. In 1956-57 the government expenditure on primary education was Rs. 622.76 lakhs. The interest at 10 per cent annum over previous years's expenditure, Rs. 577.7 lakhs, amounted to Rs. 57.77 lakhs. Hence, total government support to primary education was Rs. 680.54 lakhs in 1956-57. The total public support to primary education in Andhra Pradesh shows upward trend as shown in Table 5.10. It steadily rose to 5297.47 lakhs in 1978-79. The average annual per pupil public support worked out to be Rs. 27.73 in 1956-57 and increased to

Rs. 107.57 in 1978-79. The data presented in Table 5.10 are summarised below :

<i>Year</i>	<i>Public expenditure on primary education (Rs. lakhs)</i>	<i>Interest over previous years expenditure (Rs. lakhs)</i>	<i>Total public support (Rs. lakhs)</i>	<i>Average annual per pupil public (Rs. lakhs)</i>
1956-57	622.76	57.77	680.54	27.73
1978-79	4845.05	452.42	5297.47	107.57

It is apparent from the statement that the average annual per pupil total public support increased from Rs. 27.73 in 1956-57 to Rs. 107.57 in 1978-79, nearly four-fold increase.

Total Real Cost of Primary Education

Table 5.11 displays upward trend in total real cost of primary education not only includes interest accrued over previous year's expenditure but also the opportunity cost, defined as income forgone by the children during the period of school attendance. Schultz assumed that income forgone by the students increases with the level of education or the age of the students. He worked out in U.S. that opportunity costs formed half of the expenditure at secondary level of education. In the present study the income foregone by the children has been computed at one fourth of public expenditure. The income foregone by the children can not be obtained from age income profile based on the assumption that on income is accrued below the age of fourteen years. The children below fourteen years are employed in some agricultural operations such as watch and ward or cattle grazing, etc. The tribal show marked indifference to education because children provide support to their families. Even in urban centre, the children from poor families are employed in domestic services. The income foregone by the children even in primary education in any Indian State, infected with unemployment, may constitute an important part of the total real costs of education.

Table 5.11 presents upward trend in total real costs of primary education in the State. The following statement gives summary of the Table :

<i>Year</i>	<i>Total Govt. support to primary education (Rs. lakhs)</i>	<i>Income foregone by the children (Rs. in lakhs)</i>	<i>Total real cost (Rs. in lakhs)</i>	<i>Per pupil real cost Rs.</i>
1956-57	680.54	155.69	836.22	34.08
1978-79	5297.47	1211.26	6508.73	132.16

The statement above yields the conclusion that average annual total per pupil total real cost in primary education advanced by nearly four times during the period 1956-57 to 1978-79 under consideration.

Annual Compound Growth Rates

The period under study can be divided into four groups consisting of five years each group. The question sought to be answered was during which period the annual compound growth rate of public expenditure on primary education was higher. During the first five year period *i.e.*, 1956-57 to 1961-62, the annual compound growth rate of public expenditure on primary education was 5.41 per cent as against 17.41 per cent annual compound growth rate in State's revenues.

The following statement shows annual compound growth rates (percentages) :

<i>Period</i>	<i>Public expenditure on primary education</i>	<i>Total enrolment in primary education</i>	<i>NDP at current prices</i>	<i>Revenues of the State</i>
1956-57 to 1961-62	5.41	6.75	6.18	17.41
1961-62 to 1966-67	7.91	2.56	9.02	14.97
1966-67 to 1971-72	11.35	0.22	9.13	14.12
1971-72 to 1976-77	14.85	1.84	9.95	14.50

The annual compound growth rate of public expenditure on primary education increased from 5.41 per cent first five period 1956-57 to 14.85 per cent during the fourth five year period 1971-72 to 1976-77. During the period 1971-72 to 1976-77, the annual compound growth rate was highest *i.e.*, 14.85 per cent.

The enrolment effort as reflected in total enrolment figures, declined during successive five year periods. During 1956-57 to 1961-62, total enrolment in primary education increased but at 6.75 per cent annual compound growth rate. In subsequent second five years period, which happened to be third five year plan, the annual compound growth rate in total enrolment was only 2.56. During 1966-67 to 1971-72, the annual compound growth rate in enrolment touched the bottom *i.e.*, 0.22 per cent. The expansion of primary education during this period appears to be arrested because of slackness in official policy or increased emphasis shown to higher education.

The economic activity in the country is reflected in the growth rates of NDP at current prices. During the period 1956-57 to 1961-62 the National Domestic Product in Andhra Pradesh increased at 6.18 per cent annual compound growth rate. During subsequent five year periods, the annual compound growth rate of NDP at current prices fluctuated around 9 per cent.

The revenue collection in the State increased at 17.41 per cent annual compound growth rate, the highest during the period 1956-57 to 1961-62. In subsequent successive five year period, the annual compound growth rate of state total receipts fluctuated around 14 per cent.

During the period 1971-72 to 1976-77, the annual compound growth rate of enrolment in primary education was the lowest *i.e.*, 1.84 per cent whereas the annual compound growth rate of public expenditure on Primary education was 14.85 per cent. NDP showed 9.95 per cent annual compound growth rate, and State's receipts increased at 14.50 per cent annual compound growth rate during the same period.

During the period under study, the annual compound growth rates of enrolment lagged behind other variables, public expenditure on Primary education, NDP at current prices and State's revenues.

Costs of Education

Schultz classified total resource costs in to three groups. The first group consists of school costs incurred by society, *i.e.*, teachers, salaries, supplies, interest and depreciation on capital. The second group contains opportunity costs incurred by individuals namely income foregone during school related costs incurred by individuals *i.e.*, books and travel.

The school costs incurred by the society are defrayed through taxation. The opportunity costs are usually taken from age-income profiles of the country or region.

In India, it is difficult to estimate private resource costs *i.e.*, expenditure on tuition, travel and school uniform—the school related costs. Schultz assumed, tend to increase with the level of education and opportunity costs increase with age during the school attendance.

Public Policy in Relation to Expenditure on Education

Economics is a back seater. Politics tend to dictate economic policy and in fact all public policies including educational policy. The investment in human capital appears to be gaining importance. The central government aid to State relates to only higher education in India. The elementary education is funded by State governments. The public expenditure on education may be treated as collective business investment which will yield attractive economic returns in terms of improvements in gross National Product of the country. The government subsidisation to private educational institutes is also welcome. The investment in women's education will increase future productivity of their children. The indirect and long term effect of public expenditure on education appears to be immeasurable. The marginal productivity of human capital tends to increase with public expenditure on education as against non-human capital yields diminishing marginal returns.

There has always been under-investment in education. Increased aid to education will yield better returns in the long run. The public maintenance costs on human capital tends to be zero, whereas it tends increase on non-human capital with the volume of investment. The public expenditure on medicine and health and sanitation, housing, recreational facilities, may be treated indirectly as maintenance costs on human capital.

TABLE 5.1 : Total Expenditure on All Educational Institutions
—Direct and Indirect in Andhra Pradesh

<i>Year</i>	<i>Total expenditure (Rs. in lakhs)</i>	<i>Population estimated (Rs. in lakhs)</i>	<i>Per capita expenditure Rs. at current prices</i>
1956-57	1220.53	338.74	3.60
1957-58	1687.32	344.10	4.90
1958-59	1844.43	355.00	5.20
1959-60	2259.44	357.50	6.32
1960-61	2570.91	359.83	7.40
1961-62	2727.50	368.63	7.39
1962-63	2787.05	377.42	7.38
1963-64	2929.33	386.40	7.58
1964-65	3404.02	392.16*	8.68
1965-66	3454.83	398.00*	8.68
1966-67	4090.60	403.93*	10.13
1967-68	4843.37	409.95*	11.81
1968-69	5734.67	416.06*	13.78
1969-70	6175.82	422.26*	14.63
1970-71	7010.37	428.55*	16.36
1971-72	NA	435.03	—
1972-73	NA	449.06	—
1973-74	6273.87	459.12	13.66
1974-75	6475.60	469.62	13.79
1975-76	8026.18	480.59	16.70
1976-77	9608.69	490.83*	19.58
1977-78	11503.22	501.28*	22.95
1978-79	12263.34	511.96*	23.95

* Indicates estimated values,

NA=Not available at the time of enquiry.

Sources : (1) Office of the Directorate of School Education, Hyderabad.

(2) A.P. Statistical Abstract—Estimated Population.

TABLE 5.2 : Public Expenditures on Education as a Percentage of NDP (National Domestic Product) at Current Prices in Andhra Pradesh

<i>Year</i>	<i>NDP at current prices (Rs. in crore)</i>	<i>Expenditure on education (Rs. in crores)</i>	<i>Expenditure on education as a percentage of NDP</i>
1956-57	857.61	6.72	0.78
1957-58	886.87	10.37	1.17
1958-59	949.71	12.56	1.32
1959-60	981.14	15.30	1.56
1960-61	983.19	17.37	1.77
1961-62	1159.26	21.23	1.83
1962-63	1209.24	21.97	1.82
1963-64	1406.59	23.11	1.64
1964-65	1497.89	25.83	1.72
1965-66	1329.49	27.58	2.07
1966-67	1782.49	32.88	1.84
1967-68	1960.40	37.61	1.92
1968-69	1998.10	46.29	2.32
1969-70	2163.62	51.63	2.39
1970-71	2510.65	62.05	2.47
1971-72	2759.26	66.04	2.39
1972-73	2937.34	68.50	2.33
1973-74	3854.96	88.93	2.30
1974-75	4708.35	92.56	1.97
1975-76	4341.53	117.61	2.71
1976-77	4434.08	137.25	3.10
1977-78	5032.08	150.69	2.90
1978-79	5301.28	173.28	3.27
1979-80			
			Mean 2.07
			S.D. 0.60

Source : A.P. Statistical Abstract.

TABLE 5.3 : Average Annual Per Pupil Expenditure in Primary Education in Andhra Pradesh

<i>Year</i>	<i>Expenditure on primary education at current prices</i>	<i>Total enrolment in Classes I to V</i>	<i>Per pupil expenditure or Unit Cost</i>
1956-57	62276548	2454054	25.38
1957-58	63863227	2566800	24.88
1958-59	68169148	2659076	25.64
1959-60	72927368	2806451	25.99
1960-61	76055007	2976355	25.56
1961-62	81033010	3401665	23.82
1962-63	86440317	3518366	24.57
1963-64	83259255	3604371	24.48
1964-65	86609414	3596573	24.08
1965-66	118542159	3769174	31.45
1966-67	120987267	3859394	31.35
1967-68	133073210	3891178	34.20
1968-69	146366513	3934790	37.20
1969-70	157142383	3903954	40.25
1970-71	189518534	3882876	48.81
1971-72	202896030	5901556	52.00
1972-73	217217810	3991466	54.42
1973-74	232550504	4039989	57.56
1974-75	258805247	4093703	63.22
1975-76	344552135	4134454	83.34
1976-77	405368670	4273685	94.85
1977-78	452415950	4675907	96.75
1978-79	484505090	4925084	98.37
Percentage increase over to 1956-57	678	100	288
Compound Growth Rate	9.33%	3.08%	6.07%

Source : The Office of the Directorate of School Education, Hyderabad, (A.P.).

TABLE 5.4 : Average Annual Per Pupil Expenditure, or Unit Cost in Primary Schools at 1960-61 Prices

<i>Year</i>	<i>Expenditure on primary schools at current prices (Rs.)</i>	<i>Total expenditure at 1960-61 prices (Rs.)</i>	<i>Per pupil expenditure at 1960-61 prices (Rs.)</i>
1956-57	62276548	56048786	21.84
1957-58	63863227	61947050	23.30
1958-59	68169148	67487588	24.05
1959-60	72927368	72927368	24.50
1960-61	76056007	76056007	23.03
1961-62	81033010	69258982	20.36
1962-63	86440317	68460241	18.88
1963-64	88259255	61719758	17.16
1964-65	86602414	56975272	15.12
1965-66	118542459	87809229	22.75
1966-67	120987267	66843795	17.18
1967-68	133073210*	66870959	16.99
1968-69	146366513	72104529	18.47
1969-70	157142383	71754511	18.47
1970-71	189518534	74320992	19.05
1971-72	202896030*	72204992	18.09
1972-73	217217810*	72891882	18.04
1973-74	232550504	59476831	14.53
1974-75	258805247	54256813	13.12
1975-76	344552135	78307334	18.32
1976-77	405368670	90081926	19.27
1977-78	452415950	88709009	18.01
1978-79	484505090	90224411	17.72

* Indicates estimated expenditure.

Source : Office of the Directorate of School Education, Hyderabad, Andhra Pradesh.

TABLE 5.5 : Expenditure on Primary Education as Percentage of Total Revenues of the State in Andhra Pradesh

<i>Year</i>	<i>Total revenues of the State (Rs. in lakhs)</i>	<i>Expenditure on primary education (Rs. in lakhs)</i>	<i>Expenditure on primary education as percentage of of State's revenues</i>
1956-57	6232.63	622.77	9.99
1957-58	6752.23	638.63	9.46
1958-59	8194.40	681.69	8.32
1959-60	8528.89	729.27	8.55
1960-61	8575.83	760.56	8.87
1961-62	11287.63	810.33	7.18
1962-63	11635.76	864.40	7.43
1963-64	14269.14	882.59	6.19
1964-65	15178.83	866.02	5.71
1965-66	17225.71	1185.42	6.88
1966-67	18426.97	1209.87	6.57
1967-68	23869.67	1330.73	5.58
1968-69	24820.32	1463.66	5.90
1969-70	29626.16	1571.42	5.30
1970-71	33344.48	1895.19	5.68
1971-72	35701.00	2028.96	5.68
1972-73	45492.00	2172.18	4.77
1973-74	45969.00	2325.51	5.06
1974-75	50537.00	2588.05	5.12
1975-76	65615.00	3445.55	5.25
1976-77	81152.00	4053.69	4.99
1977-78	90280.88	4524.16	5.01
1978-79	100083.00	4845.05	4.84
Percentage increase over 1956-57	1606	778	Mean 6.89 S. D. 2.32

Source : (1) A.P. Statistical Abstract.

(2) Office of the Directorate of School Education Hyderabad,
in Andhra Pradesh.

TABLE 5.6 : Growth Rates in State's Revenues and Expenditure on Education and Expenditure on Primary Education in Andhra Pradesh

<i>Year</i>	<i>Growth rate in State's revenues percentage</i>	<i>Growth rate in public expenditure on education percentage</i>	<i>Growth rate in public expenditure on primary education percentage</i>
1956-57	—	—	—
1957-58	62.15	54.23	7.80
1958-59	8.34	21.17	2.55
1959-60	21.36	21.78	6.74
1960-61	4.08	13.54	6.98
1961-62	0.56	22.19	4.29
1962-63	31.61	3.49	6.54
1963-64	20.80	5.20	6.67
1964-65	4.64	11.76	2.10
1965-66	6.38	6.78	—1.81
1966-67	13.49	19.21	36.88
1967-68	6.97	14.38	2.06
1968-69	29.48	23.08	9.98
1969-70	4.03	11.54	7.36
1970-71	19.36	20.21	20.60
1971-72	12.55	6.43	7.06
1972-73	7.07	3.73	7.06
1973-74	27.43	29.82	7.06
1974-75	1.05	4.08	11.29
1975-76	9.94	27.06	33.13
1976-77	29.84	16.70	17.65
1977-78	23.68	9.79	11.61
1978-79	11.25	14.29	7.09
1979-80	10.86	5.11	—
Mean	15.95	15.93	10.03
S.D.	13.66	11.23	9.23

S.D. : Standard Deviation.

Source : Tables 5.1, 5.3, 5.5.

TABLE 5.7 : Expenditure on Primary Schools as a Percentage of Total Expenditure on All Educational Institutions in Andhra Pradesh

Year	Total expenditure on all educational institutions (Rs. in lakhs)	Expenditure on primary schools (Rs. in lakhs)	Expenditure on primary education as percentage of total expenditure
1956-57	1220.53	622.77	51.02
1957-58	1687.32	638.65	37.85
1958-59	1844.43	681.69	36.96
1959-60	2259.44	729.27	32.28
1960-61	2570.91	760.56	29.58
1961-62	2727.40	810.33	29.71
1962-63	2787.05	864.40	31.02
1963-64	2929.33	882.59	30.13
1964-65	3404.02	866.02	25.44
1965-66	3454.83	1185.42	34.31
1956-67	4090.60	1209.87	29.58
1967-68	4843.37	1330.73	27.48
1968-69	5734.68	1463.67	25.52
1969-70	6175.82	1571.42	25.44
1970-71	7010.37	1895.19	27.03
1971-72	NA	2028.96	—
1972-73	NA	2172.18	—
1973-74	6273.87	2325.51	37.07
1974-75	6475.60	2588.05	39.97
1975-76	8026.18	3445.52	42.93
1976-77	9608.69	4053.69	42.19
1977-78	11503.22	4524.16	39.33
1978-79	12263.34	4845.05	39.51
Percentage increase over 1956-57	1104	778	Mean 34.02 S.D. 6.75

S.D. : Standard Deviation.

Source : The Office of the Directorate of School Education, Hyderabad Andhra Pradesh.

TABLE 5.8 : Budget Allocation for Primary Education in Andhra Pradesh

<i>Year</i>	<i>Plan allocation (Rs. in lakhs)</i>	<i>Non-Plan outlay (Rs. in lakhs)</i>	<i>Total outlay (Rs. in lakhs)</i>	<i>Percentages expenditure on primary education</i>
1969-70	15.38	2153.76	2169.14	0.71
1970-71	61.06	2619.82	2680.88	2.27
1971-72	119.89	2533.49	2653.38	4.52
1972-73	163.37	2671.61	2834.98	5.76
1973-74	265.08	3424.61	3619.66	7.18
1974-75	189.03	3904.28	3093.31	4.62
1975-76	202.78	4074.96	4277.74	4.74
1976-77	266.15	4763.95	5030.10	5.29

Source : Office of the Directorate of the School Education, Hyderabad A.P.

TABLE 5.8(A) : Budget Allocation for Secondary Education Including Primary Education in Andhra Pradesh

<i>Year</i>	<i>Plan allocation (Rs. in lakhs)</i>	<i>Non-Plan allocation (Rs. in lakhs)</i>	<i>Total allocation (Rs. in lakhs)</i>
1973-74	386.95	5866.31	6253.26
1974-75	266.23	6999.64	7265.87
1975-76	281.31	7413.70	7695.01
1976-77	366.12	8617.09	8983.21

Source : Office of the Directorate of School Education, Hyderabad, A.P.

TABLE 5.9 : Average Annual Cost in Primary Education as a Percentage of NDP Per Capita in Andhra Pradesh

<i>Year</i>	<i>Unit cost</i>	<i>NDP per at current prices</i>	<i>Unit cost as percentage of NDP Per capita</i>
(1)	(2)	(3)	(4)
1956-57	25.38	235.85	10.76
1957-58	24.88	261.41	9.52
1958-59	25.64	275.99	9.29
1959-60	25.99	281.29	9.24
1960-61	25.56	275.20	9.29
1961-62	23.82	319.00	7.47
1962-63	24.57	329.00	7.47
1963-64	24.48	372.15	6.58
1964-65	24.08	394.53	6.10
1965-66	31.45	343.47	9.16
1966-67	31.35	444.73	7.05
1967-68	34.20	579.13	7.14
1968-69	37.20	478.35	7.78
1969-70	40.25	513.45	7.84
1970-71	48.81	583.59	8.36
1971-72	52.00	627.92	8.29
1972-73	54.42	654.11	8.32
1973-74	57.56	839.64	6.86
1974-75	63.22	1002.59	6.31
1975-76	83.34	993.38	9.23
1976-77	94.85	901.20	10.52
1977-78	96.75	908.50	9.69
1978-79	98.37	1026.64	9.58
Mean			8.34
S.D.			1.30

S.D.—Standard Deviation

Source : Table 5.1, 5.2, and 5.3.

TABLE 5.10 : Total Government Support to Primary Education in Andhra Pradesh

Year	Public expenditure in primary education (Rs. in lakhs)	Interest thereon (Rs. in lakhs)	Total government support (Rs. in lakhs)	Average annual public support per pupil
1956-57	622.76	57.77*	680.54	27.73
1957-58	638.63	62.28	700.91	27.30
1958-59	681.69	63.86	745.55	28.04
1959-60	729.27	68.17	797.44	28.42
1960-61	760.56	72.93	833.49	28.00
1961-62	810.33	76.06	886.39	26.05
1962-63	864.40	81.08	945.43	26.87
1963-64	882.59	86.44	969.03	26.89
1964-65	866.02	88.26	954.28	26.53
1965-66	1185.42	86.60	1272.02	33.75
1966-67	1209.87	118.54	1328.41	34.42
1967-68	1330.73	120.98	1451.72	37.30
1968-69	1463.67	133.07	1596.74	40.58
1969-70	1571.42	146.37	1717.79	44.00
1970-71	1895.19	157.14	2052.33	52.85
1971-72	2028.96	189.52	2218.48	56.85
1972-73	2172.18	202.90	2375.06	59.51
1973-74	2325.51	217.22	2542.72	62.95
1974-75	2588.05	232.55	2820.60	68.90
1975-76	3445.52	258.80	3704.33	89.60
1976-77	4053.69	344.55	4398.24	102.93
1977-78	4524.16	405.37	4929.53	105.42
1978-79	4845.05	452.42	5297.47	107.57

* Interest at the rate of 10 per cent over previous year expenditure has been computed. The assumption of 10 % rate of interest appears to be realistic.

Source : Table 5.3.

TABLE 5.11 : Total Real Cost and Per Pupil Real Cost in Primary Education in Andhra Pradesh

<i>Year</i>	<i>Total Government support to primary education (Rs. in lakhs)</i>	<i>Income foregone by the children (Rs. in lakhs)</i>	<i>Total real costs Rs. lakhs</i>	<i>Average annual per pupil real costs (Rs. in lakhs)</i>
1956-57	680.54	155.69	836.22	34.08
1957-58	700.91	159.65	860.67	33.52
1958-59	745.55	170.42	915.98	34.45
1959-60	797.44	182.32	979.76	34.92
1960-61	833.49	190.14	1023.62	34.40
1961-62	886.39	202.58	1088.97	32.00
1962-63	945.43	216.10	1161.54	33.02
1963-64	969.03	220.64	1189.68	23.01
1964-65	954.28	216.50	1170.79	32.55
1965-66	1272.02	296.36	1568.38	41.61
1966-67	1328.41	302.47	1630.88	42.26
1967-68	1451.72	332.68	1784.40	45.86
1968-69	1596.74	365.92	1962.65	49.89
1969-70	1717.79	392.86	2110.65	54.06
1970-71	2052.33	473.80	2526.12	65.06
1971-72	2218.48	507.24	2725.72	69.68
1972-73	2375.06	543.04	2918.12	73.12
1973-74	2542.72	581.38	3124.10	77.33
1974-75	2820.60	647.61	3468.22	84.71
1975-76	3704.33	861.38	4565.71	110.44
1976-77	4398.24	1013.42	5411.66	126.62
1977-78	4929.53	1131.04	5042.64	107.84
1978-79	5297.47	1211.26	6508.73	132.16

* Income foregone by the children has been computed at 1/4th of aggregate annual public expenditure to primary education.

Source : Table. 5.3.

Wastage in Primary Education : Andhra Pradesh

A global calculation of wastage and stagnation indicates that every 100 children admitted into grade I, about 45 reach grade IV and 37 reach grade V.¹

The countries are classified according to the wastage rates and in advanced countries the wastage tends to reach zero. The term 'wastage' refers to the rate of school-leavers during the five years of schooling, while the word 'stagnation' indicates the of repeaters, meaning children attending school for more years than usual five years to acquire necessary functional skills to be called literate.

In Andhra Pradesh wastage rate tends to decline in all classes during the period under consideration, as shown in Table 6.1. This is an encouraging trend. In 1957-58, the rate of wastage was 44 in class I, and declined to 37 in 1975-76 in respect of boys. The data presented in Table 6.1 are summarised below :

Year	<i>Cumulative Wastage Rate</i>			
	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>
1960-61	43	58	63	68
1974-75	36	49	41	64

1, K. Venkata Subramanian, *Wastage in Primary Education*, Orient Longmans, 1978, p. 4.

It is apparent from the statement above that wastage rate has declined in all classes during the period under consideration. In aggregate the average annual cumulative wastage rate amounted to 66 in respect of boys during the period under consideration in five years of schooling in Andhra Pradesh. It is apparent from the Table that the wastage rate is the highest in class I, during the entire period under consideration.

Table 6.2 shows declining trend in the wastage rates in respect of girls. Out of 100 girls admitted into class I in 1956-57, the number of girls who left schooling reached 76 by 1959-60. The wastage rate steadily declined to 65 by 1978-79 in primary education in respect of girls. The average rate of wastage in respect of girls is higher than boys. Out of every 100 girls, annual average drop out was 72 as against 66 in respect of boys. The present study supports the findings of earlier studies on wastage. To quote Venkata Subramanian, "the number of female drop-outs is significantly greater than the number of male drop-outs".²

The following statement brings out the difference in drop-out rates of girls and boys.

Year	<i>Average Annual Cumulative Drop Out Rates</i>			
	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>
1956-57	Boys 41	53	62	66
to				
1978-79	Girls 42	55	65	72

It is apparent from the statement that the average annual cumulative dropout rates in respect of girls are higher than boys in all classes during the period under study.

It is generally believed that the educational wastage rate is higher in weaker section of the society. The present study supports the popular belief.

2. *Ibid.*, p. 6.

Cumulative Wastage in respect of Scheduled Castes

The data are collected in respect of scheduled caste children in Andhra Pradesh during the period 1964-65 to 1978-79. Every 100 boys from SCs admitted into Class I in 1964-65 the cumulative wastage was 73 in 1968-69 as shown in Table 6.3. It is encouraging to note that cumulative wastage has shown declining trend during the period under study. The cumulative wastage rate declined to 65 by 1978-79, during the period of elementary schooling.

Table 6.4 displays wastage rates in respect of Girls from SCs. The cumulative wastage was 74 during period 1964-65 to 1967-68 and it decreased to 66 by 1978-79.

The summary results of the two Tables are shown below :

Period	<i>Average Annual Cumulative Wastage Rates</i>			
	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>
1964-65				
to Boys	38	55	65	71
1978-79 Girls	38	56	66	72

The statement shows that the cumulative annual wastage is higher in respect of girls than boys among the children of SCs.

Cumulative Wastage in respect of STs

The incidence of wastage in primary education appears to be the highest among the children of STs.

Table 6.5 shows cumulative wastage rates in respect of boys of STs. For every 100 boys admitted into I Class in 1964-65, the cumulative wastage reached 79 by 1967-68, the end of schooling period. By 1978-79, the cumulative wastage declined to 69. The wastage rates showed mild fluctuations, but in general declined over the period of time.

The wastage rate is the highest among the girls of STs as shown in Table 6.6. For every 100 girls admitted into Class I in 1964-65 the cumulative wastage was 85 during the entire period of schooling by 1967-68. It declined to 78 by the year 1978-79.

The results of the Tables 6.5 and 6.6 are summarised below.

Period	<i>Average Annual Cumulative Rates in STs</i>			
	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>
1964-65	Boys 44	59	69	76
to				
1978-79	Girls 39	57	69	78

The cumulative wastage rate is 78 the highest, in respect of girls of STs. The high dropout rates among the children of STs. are attributed to abject poverty of the tribal people.

Wastage of Human Resources

The magnitude of wastage in primary education can be seen in the number of school-leavers or dropouts during the period under consideration. The school system has not been able to generate sufficient competency to hold all the children admitted till the end of the schooling. As a consequence large number of children left primary education and remained illiterate throughout.

During the period 1956-57 to 1959-60, the number of boys who left schooling was 3.98 lakhs. This number jumped to 4.25 lakhs in subsequent school period as displayed in Table 6.7. The volume of school-leavers increased over a period of time. The data presented in Table 6.7 in respect of boys are summarised below:

Period	<i>No. of Boys Left Schools</i>				
	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Total</i>
1956-57					
to					
1959-60	256235	62646	45014	33822	397717
1974-75					
to					
1978-79	308521	94280	54706	51741	509248

The number of boys who left schooling increased in all classes during the period of study. Total number of boys who left schooling and remained illiterate stood at 95.11 lakhs, not a small figure to ignore, during the entire period under consideration.

"When you teach a girl, you teach a family" said prominent educationist. The number of girls who left schooling also increased during the period under consideration. During the period 1956-57 to 1959-60, the number of girls left schooling was 2.94 lakhs. This number increased to 3.11 lakhs during the subsequent school period. The data presented in Table 6.8 are summarised below :

<i>Period</i>	<i>No. of Girls Left Schooling</i>				
	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Total</i>
1956-57 to 1959-60	177816	51598	38995	26221	294630
1974-75 to 1978-79	193546	81533	49257	43574	367910

The number of girls left schooling increased in all classes during the period under consideration. Total number of girls who left schooling during the period 1974-75 to 1978-79 was 367910. In aggregate, 75.88 lakh girls left schooling and remained ignorant during the entire period under consideration. The cumulative effect of this wastage of human resources boys, girls, indicates colossal irreparable loss to the society, determined to strive for all round human and economic development. A developing society, or a democracy can ill afford to suffer such huge loss of human resources. It is assumed that a period of four school years are required by a child to become functionally literate. Large number of pupil years are wasted in primary education, intended to provide equal educational opportunities to all. The weaker sections become the worst victims as revealed by the study.

Wastage of Public Funds in Primary Education

The government investment on school-leavers may be deemed to have been wasted. The wastage of public funds requires to be minimised in all sectors of economy including education.

During the period 1956-57 to 1959-60, the public funds on boys who left schooling amounted to Rs. 100.95 lakhs. The wastage of public funds shows upward trend as shown in Table

6.9. The incidence of wastage of public funds is the highest in class I. The data displayed in Table 6.9 are summarised below :

<i>Period</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Total</i>
1956-57 to					
1959-60	Rs. 65.03 lakhs	15.59	11.54	8.79	100.95
1974-75 to					
1977-78	Rs. 195.05	78.57	51.89	50.06	375.57

The public funds wasted on boys who left schooling increased in all classes during the period under consideration. The total amounts wasted on boys who left schooling during school years increased by over three times during the period of study. In aggregate, the public funds wasted on boys who left schooling during the entire period amounted to Rs. 38.31 crores.

Table 6.10 shows wastage of public funds on girls who left schooling in primary education. The wastage of public funds appears to be the highest in class I in respect of girls also. During the period 1956-57 to 1959-60, the total funds on girls, who left schooling amounted to Rs. 74.77 lakhs. The volume of wastage of funds shows increasing trend during the period of study as presented in Table 6.10. The data presented in Table 6.10 are summarised below :

Wastage of Public Funds on Girls Who Left Schooling (Rs. in lakhs)

<i>Period</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Total</i>
1956-57 to					
1959-60	45.13	12.84	9.99	6.81	74.77
1974-75 to					
1977-78	122.36	67.95	46.72	42.16	279.19

The public funds wasted on girls who left schooling increased in all classes during the period of study. In aggregate, total funds wasted on girls in primary education amounted to Rs. 28.72 crores.

The public funds on school-leavers, boys and girls are shown below :

Period	(Rupees in crores)				
	I Class	II Class	III Class	IV Class	Total
1956-57 to					
1977-78	36.75	12.72	10.14	7.42	67.02

Total public funds on school-leavers during the entire period under study amounted to Rs. 67.02 crores in primary education in Andhra Pradesh. The wastage of public funds shows a steady decline from Class I to Class IV shown above.

TABLE 6.1 : Cumulative Wastage in Primary Education in Andhra Pradesh—BOYS

Year	Enrolment	I Class	II Class	III Class	IV Class
1956-57	100				
1957-58	100	44			
1958-59	100	45	54		
1959-60	100	46	55	62	
1960-61	100	43	58	63	68
1961-62	100	44	53	63	68
1962-63	100	49	54	62	68
1963-64	100	46	59	63	67
1964-65	100	44	58	67	69
1965-66	100	39	54	65	72
1966-67	100	40	51	64	71
1967-68	100	40	52	62	70
1968-69	100	41	54	63	67
1969-70	100	41	53	63	67
1970-71	100	39	54	63	69
1971-72	100	31	52	63	69
1972-73	100	39	50	60	68
1973-74	100	38	50	59	65
1974-75	100	36	49	58	64
1975-76		37	49	58	64
1976-77			48	57	64
1977-78				55	60
1978-79					51
Mean		41	53	62	66
S.D.		4.03	3.04	2.90	4.56

S.D. Standard Deviation.

Source : Table 4.11.

TABLE 6.2 : Cumulative Wastage in Primary Education
in Andhra Pradesh—GIRLS

<i>Year</i>	<i>Enrolment</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>
1956-57	100	46			
1957-58	100	47	59		
1958-59	100	46	59	69	
1959-60	100	45	58	69	76
1960-61	100	44	57	68	75
1961-62	100	53	57	67	75
1962-63	100	50	65	68	74
1963-64	100	47	64	74	74
1964-65	100	40	62	72	79
1965-66	100	40	52	70	78
1966-67	100	43	53	66	76
1967-68	100	40	54	66	73
1968-69	100	40	54	66	73
1969-70	100	38	54	66	74
1970-71	100	39	53	65	73
1971-72	100	34	51	62	71
1972-73	100	35	48	59	68
1973-74	100	34	48	59	68
1974-75	100	34	48	58	66
1975-76	100		48	59	68
1976-77	100			57	65
1977-78	100				65
Mean		42	55	65	72
S.D.		5.44	5.18	4.82	4.18

S.D. : Standard Deviation. Percentages are rounded off.
 Source : Table 4.12.

TABLE 6.3 : Cumulative Wastage in Primary Education
in Andhra Pradesh—Scheduled Castes-Boys

<i>Year</i>	<i>Enrolment</i>	<i>I</i> <i>Class</i>	<i>II</i> <i>Class</i>	<i>III</i> <i>Class</i>	<i>IV</i> <i>Class</i>
1964-65	100				
1965-66	100	41			
1966-67	100	35	60		
1967-68	100	41	58	72	
1968-69	100	37	58	91	73
1969-70	100	45	59	70	75
1970-71	100	41	65	73	80
1971-72	100	33	55	71	77
1972-73	100	34	44	60	73
1973-74	100	37	51	56	69
1974-75	100	37	51	60	68
1975-76	100	39	50	61	69
1976-77			52	59	69
1977-78				58	66
1978-79					65
Mean		38	55	65	71
Standard Deviation		3.43	5.61	6.33	4.10

Percentages are rounded off.

Source : Table 4.17.

TABLE 6.4. : Cumulative Wastage in Primary Education
in Andhra Pradesh—Scheduled Castes-Girls

<i>Year</i>	<i>Enrolment</i>	<i>I</i> <i>Class</i>	<i>II</i> <i>Class</i>	<i>III</i> <i>Class</i>	<i>IV</i> <i>Class</i>
1964-65	100	43			
1965-66	100	42	64		
1966-67	100	45	65	77	
1967-68	100	42	62	71	74
1968-69	100	42	61	71	73
1969-70	100	39	67	74	80
1970-71	100	32	57	73	78
1971-72	100	37	49	62	76
1972-73	100	31	49	59	72
1973-74	100	32	50	65	69
1974-75		33	46	61	73
1975-76			49	59	68
1976-77				58	66
1977-78					66
Mean		38	56	66	72
Standard Deviation		4.95	7.44	6.65	4.45

Percentages are rounded off.

Source : Table 4.18.

TABLE 6.5 : Cumulative Wastage in Primary Education
in Andhra Pradesh—Scheduled Tribes-Boys

<i>Year</i>	<i>Enrolment</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>
1964-65	100	38			
1965-66	100	45	56		
1966-67	100	40	61	71	
1967-68	100	39	60	74	79
1968-69	100	49	60	72	81
1969-70	100	46	63	68	76
1970-71	100	46	61	72	76
1971-72	100	46	57	70	80
1972-73	100	48	56	69	79
1973-74	100	45	61	68	74
1974-75	100	42	56	69	76
1975-76			54	68	76
1976-77				61	69
1977-78					69
Mean		44	59	69	76
Standard Deviation		3.52	2.77	3.22	3.82

Percentages are rounded off.

Source : Table 4.19.

TABLE 6.6 : Cumulative Wastage in Primary Education in Andhra Pradesh—Scheduled Tribes-Girls

<i>Year</i>	<i>Enrolment</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>Total</i>
1964-65	100	40			
1965-66	100	39	57		
1966-67	100	36	59	71	
1967-68	100	30	59	75	85
1968-69	100	46	50	70	85
1969-70	100	40	62	61	70
1970-71	100	41	61	72	74
1971-72	100	41	58	69	80
1972-73	100	40	55	66	75
1973-74	100	42	56	69	80
1974-75		36	55	67	76
1975-76			59	72	77
1976-77				68	77
1977-78					78
Mean		39	57	69	78
S.D.		3.90	3.17	3.52	4.27

Percentage age rounded off.

Source : Table 4.20.

TABLE 6.7 : Wastage of Human Resources in Primary Education in Andhra Pradesh—BOYS

Year	I Class	II Class	III Class	IV Class	Total
1956-57	256235				
1957-58	279283	62646			
1958-59	284542	63174	45014		
1959-60	294428	66314	52634	33822	397717
1960-61	325558	69210	55096	28661	424752
1961-62	422585	73932	60081	34341	440273
1962-63	390138	94546	64180	33082	456801
1963-64	368885	99505	68712	40437	504107
1964-65	314650	82291	64318	37224	623067
1965-66	331693	95803	82628	47771	601732
1966-67	352870	103172	83676	48043	581847
1967-68	358591	111297	87305	44552	538681
1968-69	355143	105316	77371	38409	560577
1969-70	319533	108715	82151	57490	567996
1970-71	251790	107179	77075	55625	55625
1971-72	327101	164144	66239	43265	514198
1972-73	320861	98284	73434	46410	539361
1973-74	299928	93061	70815	46321	535689
1974-75	308521	106471	73160	50808	547008
1975-76		94280	69246	53449	540550
1976-77			54706	26455	502101
1977-78				51741	509248
Mean				Total	9511333

Source : Table 4.9.

TABLE 6.8 : Wastage of Human Resources in Primary Education in Andhra Pradesh—GIRLS

<i>Year</i>	<i>I Class</i>	<i>II Class</i>	<i>III Class</i>	<i>IV Class</i>	<i>Total</i>
1956-57	177816				
1957-58	192878	51598			
1958-59	192216	50307	38975		
1959-60	199620	53124	42385	26221	294630
1960-61	212860	51600	41919	25533	311103
1961-62	345318	65859	51537	29601	316860
1962-63	326418	79903	48917	28016	330773
1963-64	296099	90526	55994	32807	360443
1964-65	233834	97444	53083	37443	518658
1965-66	237332	70354	50003	41927	516954
1966-67	256954	80025	84704	37843	481389
1967-68	242102	70923	75128	41620	430512
1968-69	241125	80315	68179	42360	434185
1969-70	239520	82706	73934	52254	448310
1970-71	223495	83455	64372	39096	435447
1971-72	190014	70944	51560	36984	425247
1972-73	196865	77023	46373	36441	419973
1973-74	191090	72759	60150	51722	392534
1974-75	193546	77340	59381	43009	370196
1975-76		81533	61765	53137	382142
1976-77			49257	34045	364240
1977-78				43574	367910
1978-79					
				Total	7588201

Source : Table 4.10.

TABLE 6.9 : Wastage of Public Funds in Primary Education in Andhra Pradesh—BOYS

Year	(Rs. in lakhs)				
	I Class	II Class	III Class	IV Class	Total
1956-57	65.03				
1957-58	69.49	15.59			
1958-59	72.96	16.20	11.54		
1959-60	76.52	17.24	13.68	8.79	100.95
1960-61	83.31	17.69	14.08	7.33	106.70
1961-62	100.66	17.61	14.31	8.03	112.31
1962-63	95.86	23.23	15.77	8.10	116.62
1963-64	90.30	24.36	16.82	9.90	126.49
1964-65	75.77	19.82	15.49	8.96	149.67
1965-66	104.32	30.13	25.99	15.02	150.73
1966-67	110.62	32.34	26.23	15.06	151.17
1967-68	122.64	38.06	29.86	15.24	147.37
1968-69	132.11	39.18	28.78	14.29	180.81
1969-70	128.61	43.76	33.06	23.14	200.60
1970-71	122.90	52.31	37.62	27.15	222.03
1971-72	170.09	85.35	34.44	22.50	235.99
1972-73	174.62	53.49	39.96	25.26	240.62
1973-74	172.64	53.57	40.76	26.66	274.87
1974-75	195.05	67.31	46.25	32.12	296.46
1975-76		78.57	57.71	44.54	318.98
1976-77			51.89	25.09	322.75
1977-78				50.06	375.57
Total	2163.40	725.81	554.24	387.24	3830.69
Mean	113.86	38.20	29.17	20.38	200.62

Source : Table 4.9.

TABLE 6.10 : Wastage of Public Funds in Primary Education
in Andhra Pradesh—GIRLS

(Rs. in lakhs)

Years	I Class	II Class	III Class	IV Class	Total
1956-57	45.13				
1957-58	47.99	12.84			
1958-59	49.28	12.90	9.99		
1959-60	51.88	13.81	11.02	6.81	74.77
1960-61	54.40	13.19	10.71	6.53	78.44
1961-62	82.25	15.69	12.28	7.05	80.85
1962-63	80.20	19.63	12.02	6.88	84.23
1963-64	72.49	22.16	13.71	8.03	90.14
1964-65	56.30	23.43	12.18	9.12	124.71
1965-66	74.65	22.13	15.73	13.18	128.32
1966-67	80.55	25.09	26.55	11.86	123.51
1967-68	82.80	24.26	25.69	14.23	119.21
1968-69	89.72	29.88	25.36	15.76	141.19
1969-70	96.40	33.29	29.76	21.03	151.20
1971-72	109.09	40.73	31.42	19.08	161.52
1972-73	98.81	36.89	26.81	19.23	173.66
1973-74	107.13	41.92	25.24	19.83	183.77
1974-75	109.99	41.88	34.62	29.77	200.99
1975-76	122.36	48.89	37.54	27.19	202.54
1976-77		67.95	51.47	44.28	230.83
1977-78			46.72	32.29	242.64
1978-79				42.16	279.18
Total	1511.42	546.56	459.42	354.31	2871.71
Mean	79.55	28.76	24.18	18.65	151.14

Source : Table 4.10

Fruits of Primary Education

Primary education is the first step in the educational system. The benefits of primary education are difficult to estimate. The principal aim of primary education is to produce literate citizens. The object of primary education is not to keep the children off the streets, and provide the services of child care, but it is the function of primary education to make enlightened the society.

Human Capital Formation in Andhra Pradesh

Consequent on the reorganisation of States, on linguistic basis, the Telangana region of the erstwhile Hyderabad state was merged with the Andhra State and the new and enlarged Andhra Pradesh comprising eleven revenue districts of Srikakulam, Guntur, Cuddapah, Kurnool, Vishakapatnam, East Godavari, West Godavari, Krishna, Ananthapur, Nellore and Chittoor of the erstwhile Andhra State and nine districts of Hyderabad, Medak, Nizamabad, Mahboobnagar and Adilabad of the erstwhile Hyderabad state, was formed with effect from 1st November 1956. The area of the Andhra Pradesh is 1,06,041 sq. miles.

The literate citizens provide necessary lever for functioning of a successful democracy. The primary education continues to supply a steady stream of literate citizens to the State. The benefits of literacy are two-fold. The private benefits that a person derives from primary education, are not observable. The social benefits are difficult to be stated in tangible monetary

terms. The number of literate persons may be regarded as a stock of human capital. The stock of human capital increased from 40.76 lakh literate persons in 1951 to 160.24 lakh persons in 1981. The following statement shows growth of human capital in Andhra Pradesh.

<i>Year</i>	<i>No. of literate persons (Stock of human capital) Lakhs</i>	<i>Additions to human capital Lakhs</i>	<i>Average annual growth Lakhs</i>	<i>Annual growth rate percentage</i>
1951	40.76	—	—	—
1961	76.28	35.52	3.55	8.71
1971	107.02	30.74	3.07	4.30
1981	160.24	53.22	5.32	4.97

During 1951-61, human capital increased by 35.52 lakh literate persons. In the subsequent period 1961-71, the addition to human capital was reduced to 30.74 lakhs. During the last decade 1971-81, the stock of human capital increased by 53.22 lakh literate persons at the rate of 5.32 lakh literate persons per year on an average. The annual growth rates in the stock of human capital provide interesting results. During the first decades of planned development *i.e.*, 1951-61, the average annual growth rate registered the highest, though the absolute increase in the stock of human capital is the highest during the last decade *i.e.* 1971-81. It implies that human capital, the literate persons, increased at faster rate during the period of first two five year plans 1951-61 than the rest of the period in Andhra Pradesh.

Variations in Literacy Rates

In 1981 the average literacy rate in Andhra Pradesh is 29.9 per cent which is lower than all India average literacy rate 34.8 per cent. Hence, Andhra Pradesh may be called educationally backward State. The ratio of all India average literacy rate and average literacy rate in Andhra Pradesh work out 1.16. The difference in literacy rates is nearly 5 per cent. The average literacy rate in Andhra Pradesh has been below the all India average since 1951.

The literacy rate varied among the districts of Andhra Pradesh. The districts lagging behind State's average literacy rate are Srikakulam, Vizianagaram, Vishakapatnam, Prakasham, Ananthapur, Kurnool, Mahboobnagar, Ranga Reddy, Medak, Nizamabad, Adilabad, Karimnagar, Warangal, Khammam and Nalgonda. The educationally backward districts are mostly in Telangana region and except Hyderabad, all the districts of Telangana region are educationally backward in terms of literacy rates. The average literacy rate is higher than State's average in the districts of East Godavari, West Godavari, Krishna, Guntur, Nellore, Chittoor, Cuddapah and Hyderabad. The educationally advanced districts, with higher literacy rate than all India average literacy are West Godavari, Krishna, and Hyderabad.

The literacy rates in the districts of Andhra Pradesh differed widely. The coefficient of variation is 33 per cent. Adilabad is placed at the bottom and Hyderabad ranks first in terms of literacy rates, the ratio of the highest and the lowest is 3.1 and range coefficient in 0.51.

Relationship between Literacy Rates and Agricultural Productivity

Education, a prime factor in development a prime mover of economic activity, is expected to improve productivity in all sectors of the economy including agriculture. A literate person is likely to adopt modern technology in agriculture. Primary education, the first level of education, is to achieve twin objectives of functional literacy and permanent effective literacy. Hence literacy rates are associated with increased agricultural productivity. Baldev Singh, in his study, arrived at important conclusions that the literacy rate of decision maker in agriculture has positive correlation with the productivity, and the level of Education of agricultural workers is positive relationship with the productivity per worker. In most of the studies, a definite positive relationship is observed between literacy rates and agricultural productivity.

Primary education, which imparts functional literacy, is expected to affect the abilities of the farmers in adopting modern inputs in agriculture.

Correlation is not causation and direction of effect is not certain. It is probable that richer farmers being able to afford more education. It is not possible to demonstrate double relation between agricultural productivity and literacy rate because growth is a multi-variate function.

The coefficient of correlation between agricultural productivity *i.e.*, rice yield per hectare and literacy rates, in Andhra Pradesh, is +0.217 which appears to be not much significant (Table 7.1). The regression coefficient $b=0.0054$, standard error of b is 0.0116.

Illiteracy does not appear to prevent rural people from participating in development programmes.¹ Illiteracy appears have ceased to be the road block to development programmes.

Relation between Literacy Rates and Percentage of Main Workers to Total Population

An attempt is made to identify the relationship between literacy rates and percentage of main workers to total population. It is interesting to note that there has been negative relationship between literacy rates and percentage of main workers to total population in the districts of Andhra Pradesh (Table 7.1). Karimnagar district shows highest percentage of main workers to total population, 48.56, and it records low literacy rate. Similarly Hyderabad has 27.81 per cent of main workers to total population the lowest among the districts, records highest literacy rate *i.e.*, 58.8 per cent. The coefficient of correlation is 0.857, which appears to be significant.

Relation between Public Expenditure on Primary Education and Agricultural Productivity

Table 7.2 shows upward trend in public expenditure on primary education. As the investment in primary education increased, the agricultural productivity also showed improvement. The data presented in Table 7.2 are summarised below :

1. A.S. Seetha Ramu, *Education and Rural Development*, Asia Publishing House, New Delhi. p. 149.

<i>Year</i>	<i>Public expenditure on primary educa- tion (Rs. in lakhs)</i>	<i>Agricultural productivity index</i>
1956-57	622.777	100
1974-75	2588.05	171

There has been a definite positive association between the two variables *i.e.*, public expenditure on primary education and agricultural productivity index. The coefficient of correlation between the two variables is $+0.808$ and $R^2=0.6528$.

As the coefficient of correlation is highly significant, it may not be concluded that increased public expenditure on primary education was mainly responsible for improved agricultural productivity because of inherent limitations in the correlation analysis.

Relation between Literacy Rates and Percentage of Area under Non-food Crops

It is generally believed that literate farmers would switch over to non-food crops where the returns are assumed to be better. Hence literacy rates are known to have positive relationship with percentage area under non-food crops. Table 7.3 presents literacy rates and percentage of area under non-food crops, in the districts of Andhra Pradesh. The coefficient of correlation between the two variables is $+0.1987$. The weak correlation between literacy rates and percentage of area under non-food crops demonstrates that high literacy rates failed to have any impact on the area under non-food crops, or it might be necessary to go to Taluk level for data. The uni-dimensional results may indicate uni-causal relationship, hence there is a danger to interpret the results in uni-dimensional way.

Relation between Literacy Rates and Percentage of Urban Population

The literacy rates are believed to have explicit impact on urbanisation. High literacy rates among the workers will enable them to migrate to towns and cities. Increased migration is one of the factors for rapid urbanisation. Hence, per-

centage of urban population follows literacy rates. It is also possible to show that high literacy rate is the result of urbanisation. Two-way relationship is seemingly significant between these two variables *i.e.*, literacy rate and percentage of urban population in Andhra Pradesh as revealed in Table 7.3. The coefficient of correlation between these two variables is found to be $+0.8485$, apparently assuming significant value.

Relation between Literacy Rates and Decennial Growth Rates of Population

The correlation between education and population growth rates may be indicative of the educated being able to adapt modern family planning techniques, and force down rising birth rates. Primary education has a positive role in spreading family welfare programmes, into which large public funds are pumped. Lester R. Brown, in his book 'in the Human Interest', shows that mass education at primary level is far more effective in reducing family size than the education of the elitists. Family welfare programmes seem to be more successful among the literates than among the ignorant people. It is believed that wide-spread literacy tends to reduce family size, because education affects value, handed down from generations. The literate person tends to be receptive to new ideas, new practices, preached by change agents like rural medical health visitors and family planning officers. P.R. Gopinathan Nair, in his paper on 'Decline in Birth Rate in Kerala', analysed the relationship between education and demographic variable, life, health services, family welfare programmes.

Table 7.4 presents data on literacy rates and decennial growth rates of population in Andhra Pradesh. The coefficient correlation between literacy rates and decennial growth rates of population is found to be $+0.0511$, which appears to be insignificant. The insignificant positive correlation between the literacy rates and decennial growth rates of population does not indicate the importance of education in the spread of family welfare programmes. It is possible that decennial growth rates of population are affected by inter-district migration. Hence this study does not reject the earlier

thesis that literacy rates have negative relationship with growth rates of population.

In a number of societies the attainment of literacy brings with it a sharp decline in family size. Several studies show that as women acquire literacy they reduce their number of children by about 1.5 or roughly one third.²

Table 7.4(A) presents data on female literacy rates and decennial growth rates of population in the districts of Andhra Pradesh. The coefficient of correlation between the two variables is expectedly negative but less significant—0.0298. It implies that female literacy rates explicitly have negative relation with the growth rates of population. The level of fertility reflects ingrained and interrelated socio-economic factors. Popular or Women's education may affect fertility.

Relation between Literacy Rates and Percentage of Agricultural Labourers

It is interesting to note that literacy rates have negative association with the percentage of agricultural labourers as presented in Table 7.4. The coefficient of correlation between the two variables is found to be—0.3189, apparently significant. In the district of Adilabad the literacy rate is low *i.e.*, 18.9 per cent, while it has more than 35 per cent of agricultural labourers. The demand for agricultural labour also arises from the factors like irrigation facilities. In East and West Godavari districts, where irrigation facility is sufficient, the percentage of agricultural labour is high in these districts *i.e.*, 42.7 per cent and 47.7 per cent respectively. The negative association between these two variables does not demonstrate double relation. Hence the conclusion flowing out of this analysis is fraught with risk.

The above correlation analysis does not offer competent proof to base our sustainable conclusions. The social indicators are not highly correlated because the relationships are often non-linear.

2. K. Vankata Subramanian, *Education and Economic Development in India*, Frank Bros & Co., Delhi, p. 12. para 1.13.1

The Demand for Teachers in Primary Education

One of the boons of population is the increased demand for teachers. Table 7.5 shows upward trend in the growth of population of the children in the age group of 6 to 11 years. Hence the demand for teachers in primary education has increased during the period of study, but the number of teachers employed has not increased significantly. The teachers employed as a percentage of the demand for teachers has shown declining trend displayed in Table 7.5. The data presented in Table 7.5 are summarised below :

<i>Year</i>	<i>Population of the children</i>	<i>No. of Teachers required</i>	<i>No. of teachers employed</i>	<i>Percentage</i>
1956-57	4235800	105895	77205	73
1978-79	6413391	160335	78802	49

The number of teachers employed formed 49 per cent of the demand in 1978-79. It follows that the demand for teachers exceeded the teachers employed in schools. The explanation offered by the officials in the department is that the teachers in secondary schools are also required to handle primary sections. Hence it is difficult to separately show the number of teachers employed in primary education, and their number has not reportedly increased.

Schools

The formal education is imparted in schools. In 1979-80, 39696 primary schools are classified into open space schools 2900, tents 100, thatched huts 8771, kucha buildings 7124, partly pucca buildings 2974, and pucca buildings count only 17827 forming 44.9 per cent of the total, in Andhra Pradesh. It does not require any foresight to say that pucca buildings are to be provided immediately, for improving the performance of school system.

Supply of Teachers

Supply of teachers depends on population growth and training facilities. In 1956-57, there were 31 training institutes.

The number rose to 118 in 1958-59. Some of the non-basic schools were converted into basic training schools. In 1961-62 the number of basic training schools was 88 in the State. It appears that number of teachers training schools were wound up, in 1970-71, only 54 training schools were functioning and they were closed by 1971. This happened because of increased supply of teachers could not be absorbed in primary education though the demand for schooling has been increasing ever since. India's human resources in primary education are required to be implemented.

In 1979-80, there were 12 teacher training institutes which were reopened in 1975-76 with the capacity of 150 in each with total enrolment 2352 pupils. The total expenditure on teacher education amounted Rs. 25.71 lakhs in 1979-80.

Removal of Illiteracy

We are at war, a war against illiteracy, a war we are not winning. The present study confirmed the desirability of supporting a programme to launch on State level to eradicate illiteracy, in the circumstances offering favourable trend, with a sense of urgency. The indifference in some informed circles in this programme seems to express substantial failure on the part of the government. This arose out of inability to bring together government agencies with voluntary organisations. The burden of song is to increase facilities, to spread popular education, make the nation enlightened. In short the salvation of the nation lies in the removal of illiteracy and ignorance.

It is no longer possible for less than one third of the population in the State to grow without the others. We have not been able to advance one step in this direction and there are many rocks to be removed.

A plan for Action

In 1980, the number of children in the age group 6 to 11 years, was estimated at 62.85 lakhs. All the children in this age group should be brought under primary education (6.71 per cent of the population consists of boys in this age group of

6 to 11 years as against 6.42 per cent girls. In aggregate 13.13 per cent of the population is composed of children in the school going age). All the children born in 1980 and after should be brought under school system. The demand for teachers in primary education is estimated at 157123 (1:40 in 1980) against 80000 teachers working approximately. The data for 1981, 1982 are not made available, hence 1980 has been selected as bench-mark year.

Even with the modest projection, 77123 additional teachers, at the additional cost of Rs. 94.22 lakhs at Rs. 6000 per annum on salaries for the teachers, are required. The annual output of trained teachers in all 12 running institutes in the State is only 2350, in 1980. Hence nearly 500 teacher educational institutions are to be established at the additional cost of Rs. 11.013 crores. The number of additional schools 30849 with pucca buildings at the cost of Rs. 30.85 crores (at Rs. 10,000 per school) are to be opened on phased programme. The total cost on school buildings alone account Rs. 52.72 crores.

The following statement indicates increasing burden on the State's exchequer.

<i>Year</i>	<i>Demand for teachers</i>	<i>Cost of teachers current Rs. in crores</i>	<i>Additional cost of teachers Rs. in crores</i>	<i>Total costs on teachers Rs. in crores</i>
1979-80	157123	37.83	94.22	138.65
1980-81	160705	39.72	98.93	145.59
1981-82	164369	41.71	103.88	152.87
1982-83	168117	43.80	109.07	160.51
1983-84	171950	45.99	114.52	168.54
1984-85	175870	48.29	120.25	176.96
1985-86	179879	50.70	126.26	

- (1) The demand for teachers is increasing at 2.28 per cent per annum (Population growth rate 2.28).
- (2) The cost of teachers is increasing at the rate of 5 per cent per year, a modest estimate by all measure.

It is evident from the statement that consistent efforts on war footing are to be directed towards complete elimination of illiteracy or problem remains forever.

TABLE 7.1 : Literacy Rates—Agricultural Productivity, Percentage of Workers Districts of Andhra Pradesh

<i>Districts</i>	<i>Literacy rates (1981) census (Pro)</i>	<i>Agricultural productivity rice yield per hector Kgs. (1979)</i>	<i>Percentage of main workers to total population (1981)</i>
1. Srikakulam	24.7	1104	40.44
2. Vishakhapatnam	28.6	1035	39.29
3. Vijayanagaram	23.2	—	43.79
4. East Godavari	34.5	2235	38.13
5. West Godavari	37.3	2351	39.52
6. Krishana	42.4	1965	40.53
7. Guntur	34.3	1953	43.83
8. Prakasham	29.2	1770	42.73
9. Nellore	31.8	1703	41.64
10. Chittoor	31.5	2003	41.81
11. Cuddapah	31.0	2114	41.26
12. Ananthapur	28.7	1869	42.25
13. Kurnool	28.5	1762	44.64
14. Mahboobnagar	19.5	1717	47.43
15. Ranga Reddy	28.2	—	43.44
16. Hyderabad	58.8	1996	27.81
17. Medak	21.1	2592	44.96
18. Nizamabad	21.9	2038	48.01
19. Adilabad	18.9	1360	43.48
20. Karim Nagar	21.7	2033	48.56
21. Warangal	23.9	1903	43.18
22. Khammam	25.6	1737	42.95
23. Nalgonda	23.1	1845	45.44

r_1 = Co-efficient of Correlation between literacy rates and Agricultural Productivity rice yield per hectare.

r_2 = Co-efficient of correlation between literacy rates and percentage of of main workers total population.

$r_1 = + 0.217$ $r_2 = - 0.857$

Source : (1) Census Report Andhra Pradesh 1981 (Provisional)

(2) Andhra Pradesh Statistical Abstract.

TABLE 7.2 : Public Expenditure on Primary Education and Agricultural Productivity in Andhra Pradesh

<i>Year</i>	<i>Expenditure on primary education (Rs. in lakhs)</i>	<i>Agricultural produc- tivity Index</i>
1956-57	622.77	100
1957-58	638.63	106
1958-59	—	—
1959-60	729.27	107
1960-61	760.56	104
1961-62	810.33	112
1962-63	864.40	108
1963-64	882.59	118
1964-65	886.02	125
1965-66	1185.42	104
1966-67	1209.87	112
1967-68	1330.73	119
1968-69	1463.67	104
1969-70	1571.42	110
1970-71	1895.18	119
1971-72	2028.96	143
1972-73	2172.18	126
1973-74	2325.51	151
1974-75	2588.05	171
1975-76	—	—

Co-efficient of correlation $r = + 0.8080$
 $R^2 = 0.6528$

The Agricultural Productivity Index are rounded off.

Source : (1) Office of the Directorate of School Education, Hyderabad
 A.P.

(2) Andhra Pradesh Statistical Abstract.

TABLE 7.3 : Literacy Rates—Percentage of Area Under Non-Food Crops in Andhra Pradesh Percentage of Urban Population

<i>Districts</i>	<i>1981 literacy rates (Pro)</i>	<i>Percentage area under non-food crops 1979</i>	<i>Percentage of urban population 1981</i>
1. Srikakulam	24.7	25.2	11.41
2. Vijayanagaram	23.2	—	16.02
3. Visakhapatnam	28.6	20.4	31.58
4. East Godavari	34.5	11.8	22.20
5. West Godavari	37.3	9.1	20.84
6. Krishna	41.4	10.5	32.65
7. Guntur	34.3	22.5	27.60
8. Prakasham	29.2	27.3	14.20
9. Nellore	31.8	15.0	20.79
10. Chittoor	31.5	41.4	16.82
11. Cuddapah	31.0	28.6	19.41
12. Ananthapur	28.7	41.1	20.26
13. Kurnool	28.5	29.1	24.52
14. Mahboobnagar	19.5	20.5	10.92
15. Ranga Reddy	28.2	—	23.99
16. Hyderabad	58.8	29.4	100.00
17. Medak	21.1	4.8	11.84
18. Nizamabad	21.9	5.9	29.28
19. Adilabad	18.9	25.8	19.34
20. Karim Nagar	21.7	7.1	15.72
21. Warangal	23.9	9.7	17.26
22. Khammam	25.6	9.4	16.79
23. Nalgonda	23.1	20.3	11.39

r_1 = Co-efficient of correlation between literacy rates percentage area under food crops.

r_2 Co-efficient of correlation between literacy rates and percentage of urban population.

$$r_1 = + 0.1987$$

$$r_2 = + 0.8489$$

Source : (1) Andhra Pradesh Statistical Abstract

(2) Andhra Pradesh Census 1981 (Provisional)

TABLE 7.4 : Literacy Rates and Population Decennial Growth Rates—Andhra Pradesh

<i>Districts</i>	<i>Literacy rates 1981</i>	<i>Decennial growth rate of population 1971-1981</i>	<i>Percentage of agricultural labourers 1981</i>
1. Srikakulam	24.7	7.51	33.5
2. Vizayanagaram	23.2	14.00	33.0
3. Vishakhapatnam	28.6	23.76	21.0
4. East Godavari	34.5	19.90	42.7
5. West Godavari	37.3	20.33	47.7
6. Krishna	42.4	21.99	43.7
7. Guntur	34.3	20.48	45.2
8. Prakasham	29.2	27.95	42.5
9. Nellore	31.8	23.27	44.4
10. Chittoor	31.5	21.14	32.1
11. Cuddapah	31.0	22.22	38.1
12. Ananthapur	28.7	23.78	34.6
13. Kurnool	28.5	21.30	46.7
14. Mahboobnagar	19.5	26.63	34.3
15. Ranga Reddy	28.2	42.43	28.7
16. Hyderabad	58.8	33.16	1.7
17. Medak	21.1	24.50	31.6
18. Nizamabad	21.9	27.87	28.4
19. Adilabad	18.9	27.15	35.1
20. Karimnagar	21.7	24.04	34.8
21. Warangal	23.9	23.01	38.4
22. Khammam	25.6	27.38	41.3
23. Nalgonda	23.1	25.04	37.4

r_1 = Co-efficient of Correlation between literacy rates and decennial population growth rates.

r_2 = Co-efficient of correlation between literacy rate percentage of agricultural works.

$r_1 = + 0.0511$ $r_2 = - 0.3189$

Source : Census Report Andhra Pradesh 1981 (Provisional).

TABLE 7.4(A) : Female Literacy Rates and Decennial Growth Rates of Population—Andhra Pradesh

<i>S. No</i>	<i>Districts</i>	<i>Female literacy rate</i>	<i>Decennial growth rates of population 1971-81</i>
1.	Srikakulam	14.5	7.5
2.	Vizayanagaram	13.8	14.0
3.	Visakhapatnam	19.4	23.8
4.	East Godavari	28.8	19.9
5.	West Godavari	31.7	20.3
6.	Krishna	34.4	21.9
7.	Guntur	26.9	20.5
8.	Prakasham	18.8	27.9
9.	Nellore	22.9	23.2
10.	Chittoor	19.8	21.1
11.	Cuddapah	17.7	22.2
12.	Ananthapur	15.2	23.8
13.	Kurnool	16.9	21.3
14.	Mahboobnagar	10.3	26.6
15.	Ranga Reddy	10.0	42.4
16.	Hyderabad	45.9	33.2
17.	Medak	10.9	24.5
18.	Nizamabad	11.3	27.9
19.	Adilabad	9.8	27.2
20.	Karimnagar	11.4	24.0
21.	Warangal	13.7	23.0
22.	Khammam	18.0	27.4
23.	Nalgonda	12.4	25.0

r = Co-efficient of correlation between female literacy rates and decennial growth rates of population. Literacy rates are adjusted to one place after decimal point.

$r = -0.0298$.

Source : Census Report (Provisional) 1981.

TABLE 7.5 : The Demand for the Teachers in Primary Education in Andhra Pradesh

<i>Year</i>	<i>Population of children of the group age 6-11 years</i>	<i>No. of teachers required</i>	<i>No. of teachers employed</i>	<i>Teachers employed as per- centage of the demand</i>
1956-57	4235800	105895	77205	73
1957-58	4267700	106693	74232	70
1958-59	4299700	107493	75658	70
1959-60	4331700	108293	77246	71
1960-61	4359800	108995	78521	72
1961-62	4473100	111823	81231	73
1962-63	4586500	114663	83299	73
1963-64	4699900	117498	86781	74
1964-65	4813200	120330	80538	67
1965-66	4927024	123176	79923	65
1966-67	5118559	127964	78264	61
1967-68	5300610	132515	77779	59
1968-69	5487852	137196	77738	57
1969-70	5675176	141879	78017	55
1970-71	5861829	146546	79172	54
1971-72	5994094	149852	78592	52
1972-73	6126578	153164	78339	51
1973-74	6258697	156467	79210	51
1974-75	6389423	159736	78955	49
1975-76	6520092	163005	79014	48
1976-77	6482155	162054	79393	49
1977-78	6449527	161238	79565	49
1978-79	6413391	160335	78802	49
1979-80	6284915	157123	—	—
Mean				61
S.D.				9.69

Note : The teachers estimated at 1:40

The percentage are rounded off.

(The percentage enrolment given, and population of the children in the age group 6—11 Yrs. has been estimated.)

SD = Standard Deviation

Source : Office of the Directorate School Education, Hyderabad, Andhra Pradesh.

Summary and Conclusions

EDUCATION AND ECONOMIC DEVELOPMENT

In all developing countries education has been given priority. In the early stages of development sometimes the clarity of purpose gets lost, hence everything has been attempted in principle but without much success. Education has been an important factor of development in poor countries. Education as a form of investment has to be expanded. In all countries of the world, high per capita incomes are associated with high rates of literacy. Student is a privileged object of the investment of scarce resources. Education in a developing society has to be adopted to changing experiences. The conventional cost of education consists of expenditure on school buildings, and school equipment, classified as capital cost, and recurrent cost is composed of expenditure on salaries of teachers and non-teaching staff and expenses on materials, scholarships and others. The private cost on education includes fees and incomes foregone, expenditure on books and stationary, uniforms, transport and hostels. The cost of primary schooling is relatively high in less income countries. Education contributes to social change in developing countries, a small portion of girls attend schools hence social change is slow. The measure of human capital depends on some explicit and implicit assumptions, the additions to human capital are the result of formal education. Some studies have been undertaken in Western countries to assess the economic contribution of education. The Indian contributors to the growth of literature on economics of education,

include Misra, Karnik, Shah, Panchamukhi, V.N. Kothari and Pandya. Equality of educational opportunity should be provided to all.

Progress of Primary Education in Andhra Pradesh

At the time of formation of Andhra Pradesh on 1 Nov. 1956, there were 28083 primary schools in the State. The progress of primary education is reflected in enrolment figures. In 1956-57, the boys enrolled in primary education including secondary schools with primary sections numbered 15,44,039 as against 9,10,015 girls. In 1979-80, total enrolment of boys and girls rose to 50,90,781. It is apparent that people have shown awareness and boosted up the enrolment figures. The enrolment index, defined as number of children enrolled per 10,000 population in primary education shows upward trend. The enrolment index increased from 724 in 1956-57 to 933 in 1963-64, with mild fluctuations, it reached 962, in 1978-79. Total enrolment in 1956-57 was 2,45,405 in Andhra Pradesh, and it rose to 50,90,781 in 1979-80. It is encouraging to note that ratio of girls in the total enrolment has increased over a period of time. As the demand for primary education rose, the number of schools increased. The number of primary educational institutions rose from 29,076 in 1956-57 to 39696 in 1978-79, 36.5 per cent increase during the period. There has been a sharp decline in the number of primary schools in the private sector, this might be the result of upgrading existing primary schools into secondary schools and starting high schools straightaway. The enrolment effort as reflected in number of boys and girls attending schools, indicates upward trend in the State. The average enrolment during the entire period 1956-57 to 1979-80, was 69.49 per cent. The trend in the enrolment appeared to indicate progress of primary education in the State. The average growth rate in the enrolment of girls during the period 1956-57 to 1978-79 was 3.62 per cent nearly equal to the average growth rate in National Domestic Product in the State, hence it may be said that the principle of equity is being met. It is heartening to note that the enrolment of girls has been increasing faster than the boys enrolment during the period under consideration. One has to be

concerned not only with the amount of resources consumed in the educational process but also with the results obtained by it. Out of 100 boys admitted in Class I in 1956-57, only 32 boys reached V class in 1960-61. The internal efficiency or retention rate in Andhra Pradesh is very low, there is a strong correlation between the output of primary school and literacy rates. Despite increased opportunities, the tribals exhibit weak performance for girl's education.

The number of teachers at primary level of education per 10,000 population is to be taken as Teacher index. In 1956-57 the number of teachers in primary schools in Andhra Pradesh was 77,205, and it reached to 78,802 in 1977-78. In spite of fluctuations in the size of teachers, the primary school teacher index increased during the period under study. A trained teacher is assumed to be better fit in the job, a rise in the number of trained teachers indicates general improvement in the quality of teachers. The percentage increase of women teachers was found to be greater than average increase in the number of teachers. It implies increased participation of women in primary education in the State.

Investment in Primary Education—Andhra Pradesh

People acquire useful skills, and these skills and knowledge are a form of capital. The economists have come to recognise that these skills are like property and marketable asset, hence human beings be treated as capital goods. It is difficult to estimate the magnitude of human investment because of our failure to distinguish between expenditures for consumption and for investment.

The expenditure on education in Andhra Pradesh, has been rising since 1956-57. The public expenditure on education as a percentage of National Domestic Product was 00.78 in 1956-57 and rose to 3.27 in 1978-79. The public expenditure on primary education has shown upward trend. During the period 1956-57 to 1978-79, the public expenditure on primary education rose by 678 per cent while unit cost increased by 288 per cent. In 1956-57 public investment in primary education was nearly 10

per cent of the State's revenues and declined to 4.84 per cent in 1978-79. The increase in public investment in primary education during the period 1956-57 to 1978-79 was 778 per cent as against 1606 per cent increase of State's revenues. The public expenditure on a child for 5 years of elementary schooling was around Rs.125 during the period 1956-57 to 1960-61, and steadily increased to Rs. 336 during the period 1974-75 to 1978-79. The increase in public investment on an elementary school graduate was nearly two-fold. The average annual per pupil public investment rose by 6.07 per cent, compound growth rate as against 3.08 per cent compound growth rate in the aggregate enrolment during the same period. The improvements in State's revenues are reflected in public support to social services including education and decline in State's income will have its impact on educational outlays. The average growth rate, in State's revenues and public outlay on education were nearly equal during the period under consideration, but expansion in public investment in primary education lagged behind the aggregate public outlay on education. The share of the primary education in the aggregate investment in education appeared to have declined during the period under consideration. The percentage share of the primary education tended to decline from 56 per cent in first plan to 35 per cent in fourth plan. Our educational policy is concentrating on the top of a heavy structure with a weak base. The average annual per pupil total public support increased from Rs. 27.73 in 1956-57 to Rs. 107.57 in 1978-79. The average annual per pupil total real cost, including the income foregone, advanced by nearly ten times during the period under consideration. During the period under study, the annual compound growth rates of enrolment lagged behind other variables, i.e., public investment in primary education, National Domestic Product at current prices and State's revenues. In India it is difficult to estimate private resource costs or expenditure on tuition, travels and school uniform. The school related costs tend to increase with the level of education and opportunity costs or income foregone, increase with age during the period of school attendance. The maintenance costs on human capital tend to be zero but, expenditure on medicine and health services and

sanitation may be treated as maintenance costs on human capital.

Wastage in Primary Education—Andhra Pradesh

A global calculation of wastage and stagnation indicates that every 100 children admitted into grade I about 45 reach grade IV and reach grade V. The term 'wastage' refers to the rate of school leavers during the five years of schooling while the word 'stagnation' indicates the rate of repeaters. In Andhra Pradesh wastage rate tends to decline in all classes during the period under study. The present study supports the findings of earlier studies on wastage. The number of female dropouts is significantly greater than the number of male dropouts. The average annual cumulative drop out rates in respect of girls are found to be higher than boys in all classes during the period under consideration. The cumulative annual wastage rate is higher in respect of girls than boys among the children of scheduled castes and scheduled tribes. The cumulative wastage rate was 72 in class IV in respect of girls of scheduled caste as against 71 for boys. The incidence of wastage in primary education appears to be the highest among the children of scheduled tribes. For every 100 boys enrolled in class I in 1964-65, the cumulative wastage reached 79 by 1967-68. The wastage rates showed mild fluctuations, but in general declined over a period of time. For every 100 girls admitted in class I, in 1964-65, the cumulative wastage was found to be 85 in 1967-68. The high dropout rates among the children of scheduled tribes are attributed to abject poverty of the tribal people. The cumulative wastage among the girls of scheduled tribes during the period under study increased from 39 in Class I to 78 in Class IV. The magnitude of wastage in primary education can be seen in the number of school leavers or dropouts. The school system has not been able to generate sufficient competency to hold all the children during the period of schooling. As a consequence large number of children left primary education in Andhra Pradesh and remained illiterate throughout their existence. The volume of school-leavers increased over a period of time. The number of boys who left schooling increa-

sed in all classes during the period of study. Total number of boys who left schooling and remained illiterate was 95.11 lakhs, not a small figure to ignore. The cumulative wastage of huge human resources, boys and girls indicates great loss to the society. A developing society or democracy can ill afford to suffer such huge loss of human resources. The weaker sections became the worst victims as reported earlier.

The public investment on school-leavers may be deemed to have been wasted. The wastage of public funds requires to be minimised in all sectors of the economy including education. The public funds wasted on boys who left schooling increased in all classes. Total wastage of funds the respect of boys amounted to Rs. 38.31 crores as against Rs. 28.71 crores on girls who abandoned schooling during the entire period under study. The volume of wastage of funds appeared to indicate increasing trend during the period. The public investment on school-leavers during the period amounted to Rs. 67.02 crores in primary education in Andhra Pradesh.

Fruits of Primary Education

There appeared some islands of intellectuals in the vast sea of illiteracy in India during the past over three decades. Primary education, the first step in the educational system is expected to impart functional literacy to the people. The fruits of primary education cannot be precisely measured. The literate citizens provide necessary lever to a successful democracy. The stock of human capital in Andhra Pradesh increased from 40.76 lakh literates in 1951 to 160.24 lakhs literate persons in 1981. Human capital increased at faster rate in the first two plans in Andhra Pradesh. The variations in literacy rates in the districts of Andhra Pradesh, show that the districts of Telangana region are educationally backward.

One of the boons of population expansion is increased demand for teachers. The supply of teachers is far behind the demand for teachers. Hence, a plan for action to remove illiteracy in the State is proposed. All the children born in 1980 and after should be brought under primary education.

The demand for teachers in 1980 at 1:40 is estimated at 157123 as against 50,000 teachers working in schools. The demand for teachers is expected to rise by 2.28 per cent per annum. Total cost of teachers in 1979-80 was estimated at Rs. 132.05 crores, and likely to advance to Rs. 176.96 crores by 1985-86. The average output of teachers from teacher education centres, should increase to match the demand for teachers consistent efforts on war footing are to be directed towards complete elimination of illiteracy in the State.

Glossary

Education Expenditure : The expenditure includes all funds devoted to education by Government, District Board, Municipal Boards. Expenditure relate to the amount actually spent during the year.

School Going Age : The boys and girls in the age group of 6+ and 10+ (Boys estimated at 6.71 per cent, girls estimated at 6.42 per cent of the population).

Academic Year : The academic year is taken to coincide with the financial year are from April 1st of one Year to March 31st of the Next Year.

Current Year : The current year means the year for which the statistics are being furnished.

Recognised Institutions : All those institutions, in which the course of study followed that which is prescribed or recognised by the department of Public Instruction or by a University, or by a Board of Secondary or Intermediate Education constituted by law.

Enrolment : For definiteness scholars on rolls in the institutions on 31st March of the academic year in question are taken.

Government : Includes both Central and State Governments unless otherwise provided for.

Primary Schools : To include Lower Elementary Schools, Having standards 1 to 5.

Capital : Anything that yields a stream of income over time, and income as the product of capital. Income yielding asset, produced factor of production.

Consumption Capital : That yields a flow of services enjoyed directly, contributing to utility. The returns on consumption capital are not observable and difficult to estimate.

Production Capital : That yields a flow of goods, the consumption of which yields utility. The returns on production capital are observable and can be estimated.

Capital embodied in Human and Non-Human Material : These include arts, music, dance, and poetry.

Capital embodied in Neither Human Nor Non-Human : Culture is the capital of society.

Human Capital : By inherently and by legal tradition, the individual has control over the use of capital invested in him, regardless of source of finance of the investment. Human capital can not be separated from the individual. The expenditure on the creation of human capital has consumption aspect and investment aspect. The control over the use of capital is vested in the individual. The investment in human capital is provided free or at subsidised price. Hence, the need for efficient use of human capital is not felt.

Capital Goods : Which render specific services production or consumption by the owner.

Social Capital : Collective capital, the services to production or consumption are not charged to the individual users but they are paid for by taxation.

Intellectual Capital : Knowledge, once it is created it becomes freegood, in the sense that the use of it by one individual does not diminish its availability to others. The cost of investment in knowledge cannot be recouped and investment in knowledge is not economically efficient.

Knowledge : Knowledge pervades implying values, actions, and interpretations. Knowledge forges our being. It requires toil and frustration of creative effort. It is the intellectual regulator, once it is created it becomes free good.

Information : Information is human only as product of human being. Information catalogues out presence.

Income or Return : The yields on all forms of capital, interest or return.

Investment : Increase in physical capital, increase in health, discipline, skill, education, new knowledge, increase in efficiency, and productive process.

Costs : Use of current resources, money, equipment, and time in the process of production or learning.

Growth : Process of accumulation.

Economic Growth : Process of accumulation of capital.

Total Resource Cost : Social cost meaning public expenditure on teachers salaries, supplies of educational appliances. Capital cost-expenditure on buildings, land, equipment, furniture, interest and depreciation on capital invested, plus opportunity costs *i.e.*, income foregone by the students during the period of study, plus other related private costs incurred on books, uniforms, and travel, tuition fees and other fees paid to the institutions.

Internal Rate of Return : It is estimated by finding rate of discount, the present value of cost outlays, and the present value of additional income flows.

Opportunity Costs : The additional life time income, as the income of the person in the school. The income of the student during the period of study is zero while his income earning counterpart receives positive income. The difference measure opportunity costs.

Social Rate of Return : It is the rate of return to total resources cost. The social rate of return to investment takes additional account of those returns that are produced indirectly the social returns to education equal the sum of the gains to all individuals.

Option Value : It adds to the conventional rate of return for secondary schooling, the difference between the yield of higher education and the yield of business capital, multiplied firstly by the proportion of secondary school-leavers who enter and complete university and secondly by the ratio of the costs of the two levels of education to permit addition of the corresponding rates of return.

$$\text{Option value} = \text{or } R_s + (Y_b - Y_e) \frac{S_l}{P_s} \times \frac{C_s}{C_h}$$

R_s = Rate of return on secondary education.

Y_b = Yield on business capital.

Y_e = Yield on investment in education.

S_l = Secondary school leaver who complete university education.

P_s = Student population in secondary education.

C_s = Costs of secondary education.

C_h = Costs of higher education.

Social Opportunity Cost of Education : The value to the society of the next best alternative use of the resources invested on education or, the present value of the consumption stream, that would be created by releasing the resources now invested in education.

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Index

- Agricultural productivity and expenditure on education, 148-49 and literacy, 147-48
- Andhra Pradesh,
 - action plan for removal of illitracy in, 153
 - compulsory education in, 19
 - educational surveys in, 20
 - expenditure on eduactional insti-tutions in, 117,123
 - human capital in 145 46
 - literacy rate in, 146-53, 156, 158
 - people of, 16
 - primary education in, 50-102, 163-64
 - revenues of, 18-19
 - rural and urban population of, 17
 - school age population in, 18
 - socio-economic indicators of, 16-20
 - women participation in work in, 18
 - work force in, 17-18
- Azad, 13
- Beckers, 10 28
- Bhatnagar, Suresh, 15, 72, 107, 111
- Blaug, M., 9, 40
- Bowen, W.G, 9,43
- Bridgman, 10
- Buch, M.B., 11
- Burton, 10
- Chaudhari, 14
- Cost-benefit analysis of expenditures, on education, 40-38
- D'Aeth, Richard, 105
- Datta, 13
- Denison, Edward F., 10-21,45,47
- Domar, 10
- Dong, Fred, 21
- Earning functions, 35-36
- Economic development, and education, 1-22, 162-63
- Economics of education, literature on, 2-13
- Edding, 9
- Education,
 - in Andhra Pradesh, 18-20
 - benefits of, 41-48, 145-61, 16-768
 - as consumption, 4-5
 - consumption benefits of, 42
 - cost of, 5, 14, 115, 127
 - cost-benefit analysis of expendi-ture on, 40-49
 - and economic development, 1-22, 162-63
 - economics of, 8-13
 - enrolment for in Andhra Pradesh, 51-102
 - expenditures on, 40-49
 - financing of, 13
 - formal, 31
 - and GNP, 40
 - and as human capital, 7-8
 - implications of, 48-49
 - indirect benefits of, 46-48
 - as investment, 2-4, 8
 - Kothari Commission on, 15-16
 - literature on, 8-13

- primary, 6, 50-102, 163
- and productivity, 13-14
- public investment on, 106-16**
- as quasi-public good, 46-47
- return on, 45, 47
- of scheduled caste/tribes, 64-69
 - and social change, 6-7
 - in third world, 5-6
- women's participation in, 71-72
- Educational financing, literature on, 13
- Educational institutions, 117, 123
- Educational investments, rate of return to, 8
- Educational system, functions of, 6-8
- Elvin, 9
- Expenditures, types of, 30
- Formal education, and human capital, 31
- Galbraith, J.K., 1-3
- Girls, primary education of in
 - Andhra Pradesh, 52, 56-61, 81, 83, 86-87, 97
- Gross National Product (GNP), and education, 40-41
- Hall, Arden, 21
- Hansen, 12
- Heyneman, Stephen P., 8, 69
- Human capital
 - approaches to, 23-39
 - concept of, 23, 32-39
 - determinants of, 30-32
 - dimensions of, 229-30
 - and formal education, 31
 - formation of in Andhra Pradesh, **145-46**
 - and health services, 30
 - investment in, 104-05
 - and on the job training, 30
 - market valuation of, 37-39
 - measurement of, 8
 - and migration, 31-32
 - opposition to, 32-33
 - and physical capital, 25-29
 - and study programme, 31
 - support to, 33-34
- Human resources, wastage of, 131-32, 141-42
- Illiteracy, removal of in Andhra Pradesh, 153-54
- Investment
 - on education, 105-16, 118-22
 - on human capital, 104-05
- Karnik, 13, 163
- Kendrick, 10
- Kothari Commission, 15-16
- Kothari, V.N., 163
- Learning functions, 27-28
- Literacy rate in Andhra Pradesh, 146-53, 156, 158-60
 - and agricultural labourers, 151
 - and agricultural productivity, 417-49
 - and area under non-food crops, 149
 - and growth rate of population, 150-51
 - and urban population, 149-50
- Little, Graham R., 24
- Lorenz, 69
- Marshall, Alfred, 7
- Massell, B.F., 10
- Mincer, 28
- Misra, 13, 163
- Musgrave, Richard A., 21
- Nair, 13
- Panchamukhi, 13, 163
- Pandya, 131, 63
- Paul, Streeten, 2
- Physical capital, and human capital, 25-29
- Pillai, 13
- Primary education, in Andhra Pradesh
 - benefits of, 145-61, 167-68
 - class-wise enrolment in, 59-61, 84-87, 94-97
 - cost of, 5, 14, 115, 127

- cumulative wastage in, 128-31,
 135-44
 district-wise enrolment in, 93, 91
 efficiency in, 61-64, 67-69, 88-89
 enrolment in, 51-52, 52-61, 81-82
 94-98
 enrolment index, in, 75
 enrolment of girls in 81, 83,
 86-87, 97
 Government support to, 126
 input-output ratio in, 93-99
 investment on, 105-16, 119-27,
 164-66
 plan-wise outlay for, 110-12,
 124-25
 progress of, 50-102, 163-64
 public expenditure on, 106-10,
 118-19, 148-42, 157
 public policy in relation to,
 115-16
 public support to, 112-15
 to scheduled caste/tribes, 64-69,
 94-98
 teachers in, 69-71, 99, 152-53, 161
 in Third world, 6
 wastage in, 128-44, 166-67
 Primary school teachers index, in
 Andhra Pradesh, 100
 Primary schools, in Andhra
 Pradesh,
 enrolment in, 73-75, 80
 by management, 76-77
 numbers of, 53-55, 152
 scheduled castes/tribes in, 64-69,
 94-98
 sex-wise, 78, 80-61
 teachers in, 69-71, 79, 99-100
 trained teachers in, 101
 women teachers in, 102
 Productivity, and education, 13-14
 Public funds, wastage of in educa-
 tion, 132-34, 143 44
 Public policy, relation to
 expenditure education, 115-116
 Scheduled castes/tribes
 cumulative wastage in respect,
 of, 13-031, 138-40
 education to, 64, 69, 94, 98
 School efficiency in primary
 education, 88, 90,
 Schooling, cost benefit analysis
 of, 21-22
 Schultz, Theodore W., 3, 7, 9, 33,
 41, 104 05
 Shaffer, H.G., 32
 Shah, 13, 163
 Singh, 14
 Sinha, 13
 Social change, and education, 6-8
 Solow, 10
 State's revenues, and public
 expenditure, 108-10
 Subramanian, K. Venkata, 8, 61-63,
 128 29, 151
 Svennilson, 9
 Vaizey, 44
 Weiss, Yoram, 21
 Wolfe, 10



40
12/87.

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379
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